PB82-114273

Quality Assurance Audits for SIP and NECRMP Emission Inventories, New York and New Jersey

Pacific ENvironmental Services, Inc.
Santa Monica, CA

Prepared for

Environmental Protection Agency
New York

Aug 81

U.S. Department of Commerce
National Technical Information Service
NTIS.

PB82-114273

United States
Environmental Protection
Agency

Region II Office
26 Federal Plaza
New York, N.Y. 10007

EPA 902/4-81-002

Air

EPA

FINAL REPORT

EPA CONTRACT NO. 68-02-3511
WORK ASSIGNMENT NO. 8

QUALITY ASSURANCE AUDITS FOR SIP AND NECRMP EMISSION INVENTORIES NEW YORK AND NEW JERSEY

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 902/4-81-002	2.
3. RECIPIENT'S ACCESSION NO. PB82 114273	
4. TITLE AND SUBTITLE QUALITY ASSURANCE AUDITS FOR SIP AND NECRMP EMISSION INVENTORIES New York and New Jersey	5. REPORT DATE August 1981
	6. PERFORMING ORGANIZATION CODE U28202 5
7. AUTHOR(S) L.G. Wayne & J. Cassmassi	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Pacific Environmental Services, Inc. 1930 14th Street Santa Monica, California 90404	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. EPA 68-02-3511 Work Assignment No. 8
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency, Region II 26 Federal Plaza New York, New York 10007	13. TYPE OF REPORT AND PERIOD COVERED Final Report
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Quality assurance audits were performed covering emission inventories for volatile organic compounds and oxides of nitrogen in the State of New Jersey and in a portion of the State of New York comprising the counties of Rockland, Westchester, Nassau, Suffolk, Bronx, New York, Queens, Kings and Richmond.

Point source listings were compared with EPA's RACT directory and with State Industrial Directories to compile lists of possibly missing point sources. Methodology involved in segregating point and area sources, in estimating emissions and in seasonal adjustment of the inventories to a typical summer-day basis was reviewed. Area source categories and the methodologies and apportioning factors applied to them were reviewed. Results are extensively tabulated.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Emission Inventories Quality Assurance New York New Jersey		

18. DISTRIBUTION STATEMENT Release Unlimited	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 98
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

EPA 902/4-81-002

FINAL REPORT

EPA Contract No. 68-02-3511
Work Assignment No. 8
PES Project No. 528

QUALITY ASSURANCE AUDITS FOR SIP AND NECRMP EMISSION INVENTORIES NEW YORK AND NEW JERSEY

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region II
26 Federal Plaza
New York, New York 10007

August 1981

Pacific Environmental Services, Inc.

CORPORATE OFFICES 2716 OCEAN PARK BOULEVARD, SUITE 3010 SANTA MONICA, CA 90405 (213) 450-1800

WESTERN OPERATIONS 1930 14th STREET SANTA MONICA, CA 90404 (213) 450-1800

MIDWEST OPERATIONS 485 FULLERTON AVE ELMHURST, ILL 60126 (312) 530-7272

RESEARCH TRIANGLE PARK OPERATIONS 1905 CHAPEL HILL ROAD DURHAM, N.C. 27707 (919) 493-3536

WASHINGTON, D.C. OPERATIONS 8150 LEESBURG PIKE, SUITE 600 VIENNA, VIRGINIA 22180 (703) 790-0272

TABLE OF CONTENTS

Section		Page
1.0	INTRODUCTION	1-1
1.1	Project Approach	1-1
1.2	Emission Inventory Documentation	1-4
1.3	Results of the Audit	1-5
1.3.1	Point-Source Data Quality Audits	1-5
1.3.2	Area-Source Data Quality Audits	1-16
2.0	NEW JERSEY AUDIT	2-1
2.1	Comparison with RACT Directory	2-1
2.2	Comparison with State Industrial Directory	2-1
2.3	Review of Methodologies for Minor Point Sources	2-19
2.3.1	Conclusions and Recommendations	2-26
2.4	Engineering Review of Point-Source Emission Estimates	2-27
2.4.1	Implied Emission Factors From New Jersey Inventory	2-28
2.5	Review of Area-Source Methodologies	2-30
2.6	Review of Area-Source Factors and Computations	2-35
2.6.1	Gasoline Service Stations	2-35
2.6.2	Degreasing (Small Industrial/Commerical)	2-36
2.6.3	Dry Cleaning	2-36
2.6.4	Architectural Surface Coating	2-36
2.6.5	Auto Body Refinishing	2-37
2.6.6	Graphic Arts	2-37
2.6.7	Commercial/Consumer Solvent Use	2-37
2.6.8	Cutback Asphalt	2-37
2.6.9	Pesticides	2-37
2.6.10	Stationary Source Fossil Fuel Combustion	2-37

Section

		Page
	2.6.11 Aircraft	2-38
	2.6.12 Railroad Locomotives	2-39
	2.6.13 Vessels	2-39
	2.6.14 Off-Highway Vehicles	2-40
	2.6.15 Onsite Incineration	2-40
	2.6.16 Open Burning	2-40
	2.6.17 Structural Fires	2-41
	2.6.18 Forest Fires	2-41
3.0	NEW YORK AUDIT	3-1
3.1	Comparison with RACT Directory	3-1
3.2	Comparison with State Industrial Directory	3-1
3.3	Review of Methodologies for Minor Point Sources	3-14
	3.3.1 Conclusions and Recommendations	3-18
3.4	Engineering Review of Point-Source Emission Estimates	3-19
	3.4.1 Conclusions and Recommendations	3-25
3.5	Review of Point-Source Estimation Methodology	3-26
3.6	Review of Area-Source Methodologies	3-28
3.7	Review of Area-Source Factors and Computations	3-29
	3.7.1 Gasoline Service Stations	3-29
	3.7.2 Degreasing (Small Industrial/Commercial)	3-29
	3.7.3 Dry Cleaning	3-29
	3.7.4 Architectural Surface Coating	3-30
	3.7.5 Auto Body Refinishing	3-30
	3.7.6 Graphic Arts	3-31
	3.7.7 Commercial/Consumer Solvent Use	3-31
	3.7.8 Cutback Asphalt	3-31
	3.7.9 Pesticides	3-32
	3.7.10 Stationary Source Fossil Fuel Combustion	3-32
	3.7.11 Aircraft	3-33
	3.7.12 Railroad Locomotives	3-33
	3.7.13 Vessels	3-33
	3.7.14 Off-Highway Vehicles	3-33

Section

Page

3.7.15 Onsite Incineration..... 3-33
3.7.16 Open Burning..... 3-33
3.7.17 Structural Fires..... 3-34
3.7.18 Forest Fires..... 3-34

LIST OF TABLES

Table		Page
1-1	SIC Categories Included in Industrial Directory Search....	1-11
1-2	Source, EPA-450/2-77-028, "Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds, Volume I," Second Edition, September 1980.....	1-17
2-1	Plants Named in RACT Directory but not in New Jersey Inventory of Major Point Sources.....	2-2
2-2	Criteria Firms From Bergen County not Found in Emissions Summary.....	2-20
2-3	Implied Emission Factors vs. AP-42 Emission Factors.....	2-21
3-1	Plants Named in RACT Directory but not in New York Inventory of Major Point Sources.....	3-2
3-2	Criteria Firms From Nassau County not Found in AIR-100....	3-9
3-3	Estimated VOC Emissions From Graphic Arts for the Counties of New York City, Based on Population and Per Capita Factors, Compared with NYSDEC Point and Area Source Estimates.....	3-18
3-4	VOC Emissions Estimated by NYSDEC (Summary Tables) for Categories With Emissions From Both Point and Area Sources, in the Outer Counties.....	3-19
3-5	Discrepancies in Emissions in AIR-100 Printouts.....	3-21
3-6	Types of Point Sources Covered in New York AIR-100 System.....	3-27

1.0 INTRODUCTION

The Clean Air Act Amendments of 1977 required that states submit 1979 plans that demonstrate attainment of the National Ambient Air Quality Standard (NAAQS) for ozone by 1982. The Act allowed states that could not meet the 1982 attainment date for ozone to receive an extension of the attainment date to 1987. States that received an extension are required to submit attainment plans by July 1, 1982.

Important components of the 1982 plan submission are accurate reactive volatile organic compound (VOC) and nitrogen oxides (NO_x) emission inventories. The inventories will be used in mathematical models to determine the level of control needed to attain the NAAQS for ozone. These same inventories will be used as input to the Northeast Corridor Regional Modeling Project (NECRMP).

Because of the emphasis placed on current, comprehensive and accurate data bases, it is necessary to assure the quality of the inventories. This work assignment directed PES to assist in reviewing the data and procedures used by the states and local agencies during the compilation of these inventories.

1.1 PROJECT APPROACH

Basically, the assignment was to provide a quality assurance audit covering all major point sources and all area source categories, except highway vehicle use, of VOC and NO_x emissions in the State of New Jersey and a portion of the State of New York, comprising nine counties: Rockland, Westchester, Nassau, Suffolk, and (in New York City) Bronx, New York, Queens, Kings and Richmond.

Tasks and subtasks constituting this assignment, as agreed upon by EPA and PES and later modified by an official assignment change, were the following.

TASK 1. POINT-SOURCE DATA QUALITY AUDITS

a. Compare point-source inventory listings with source list in EPA's RACT Directory.
b. Compare point-source inventory listings with facilities listed in State Industrial Directories for New York and New Jersey.
c. Review minor-point-source methodologies.
d. Compile employment figures by SIC code and compare with County Business Patterns and State Industrial Directories.
e. Manually review VOC emissions estimates for a representative sample of the largest point sources.
f. Review major-point-source methodologies.
g. Apply EPADAS to point-source EIS file.

TASK 2. AREA-SOURCE DATA QUALITY AUDIT

a. Review area-source methodologies.
b. Review area-source factors and emissions data.

To carry out the assignment, PES undertook the following approach, as set forth in the work plan submitted on March 20, 1981.

TASK 1. POINT-SOURCE DATA QUALITY AUDIT

a. PES will compare each State's point source listing with those sources listed in EPA's Directory of Volatile Organic Compound Sources Covered by Reasonably Available Control Technology (RACT) Requirements, Volumes I-III, EPA-450/4-80-007a,b,c, and will prepare a report listing any sources believed to be mssing from the point source inventory.

b. PES will compare each state's point source listing with other directories of industries available from local sources, and will list any sources believed to be mssing from the state's point source inventory.

c. For each state, PES will review the methodology involved in creating area source files to account for VOC and NO_x emissions from minor industrial facilities (i.e., those which emit less than 100 TPY of each pollutant). PES will then prepare a report indicating whether any significant amounts of pollutants might be overlooked in this accounting, and recommending corrective measures where needed.

d. PES will compile total indicated point source employment, by county and 4-digit SIC code, and will compare these totals with related totals published in County Business Patterns or State Industrial Directories. PES will then prepare a report, indicating whether any discrepancies found are large enough to require special effort in supplementing the inventory, and recommending particular steps to be taken.

e. PES will manually review VOC emissions estimates for approximately 100 of the largest individual point sources, representing at least 25 facilities having total VOC emissions of more than 1,000 TPY. These facilities will be selected to represent several major industry categories and all the major industrial localities in the study area. PES will review all relevant calculations for accuracy and will check input values for plausibility. Where possible, PES will check these input values for consistency with permit files and original questionnaire responses.

f. PES will reviewed the documentation furnished by each state regarding methodology for estimating emissions, including the estimation of activity levels, fraction of nonreactive VOC components, seasonal and weekday adjustments, and efficiencies of control equipment. PES will then prepare a report listing any significant reservations concerning the point-source methodology and estimating the possible quantitative effects of revisions.

g. PES will apply the data-quality edit-check system, EPADAS, to emission inventory data for the major point sources of VOC and NO_x, when the data are furnished in EIS/P&R format.

EPADAS checks file information and determines whether it conforms to pre-established ranges, tables and formats. In addition, it checks certain calculations to test for consistency between interrelated entries, such as, for example, stack diameter, exhaust flow rate, and exhaust velocity. PES will determine which of these data-checks can usefully be applied to the EIS file as received, and will then run EPADAS and provide a listing and an interpretive report on the diagnostics received.

TASK 2. AREA-SOURCE DATA QUALITY AUDIT

a. PES will check the area-source narrative documentation furnished by each state, to confirm that all of the area-source categories identified in EPA-450/2-77-028 have been included for each county in the nonattainment area, and identified any omissions in a letter report.

b. PES will review the area-source documentation to confirm that appropriate methodology has been applied for each area-source category, and will review the tabulated activity levels, apportioning factors, emission factors and assumed control efficiencies for their plausibility and applicability in the context of estimating VOC and NO_x emissions. These data and the resulting emission estimates will be judged for reasonableness based on guidance in Volume I (EPA-450/2-77-028), Final Emission Inventory Requirements for 1982 Ozone SIP's (EPA-450/4-80-016) and VOC/NO_x Emission Inventory Requirements for 1982 Ozone SIP's Workbook, (OAQPS, October 1980). This review will include a check of the procedures used to (1) exclude nonreactive VOC, and (2) adjust annual totals to typical summer weekday conditions.

1.2 EMISSION INVENTORY DOCUMENTATION

To accomplish the tasks listed, PES was furnished with appropriate documentation from each state. The documents received were the following.

From New Jersey, the Department of Environmental Protection (NJDEP) provided:

1. Dated April 1, 1981, the New Jersey area source inventory, excluding minor industrial sources and highway mobile sources, with narrative description of methodology and data sources for the 1982 SIP.

2. Point-source emissions data, in computer printout form, from the New Jersey APEDS-to-EIS conversion system.

3. Emission summaries, in computer printout form, for all sources (HC or NO_x) greater than or equal to 100 tons per year.

4. TSP, SO_2, CO, NO_x, and HC emission summaries by point and plant for each New Jersey county.

From New York, the State Department of Environmental Conservation (NYSDEC) provided:

1. Summaries of VOC and NO_x emissions for 1980, by county

2. Lists of VOC and NO_x point sources, by county

3. Narrative descriptions of the inventories

4. Description of AIR-100 program

5. Emission summaries from the AIR-100 file

6. Computer printouts covering point sources of VOC

1.3 RESULTS OF THE AUDIT

Progress and results of the quality assurance audit are reviewed in a general manner in this section, and further detail will be found in subsequent sections of this report. The following subsections deal with the tasks and subtasks listed in the Project Approach, Section 1.1, in the order given there.

1.3.1 POINT-SOURCE DATA QUALITY AUDITS

1.3.1.1 Comparison with RACT Directory

This task was completed for both New Jersey and New York. Section 2.1 describes the results with New Jersey's major point source inventory, and Section 3.1 presents corresponding information regarding the New York inventory. The RACT Directory identified, in New Jersey, 337 plants subject to RACT, of which 266 (79 percent) were not found in the New Jersey inventory; in New York, 130 plants subject to RACT, of which 89 (68 percent) were not found in the New York inventory. Lists of these plants are given in Tables 2-1 and 3-1, respectively.

1.3.1.2 Comparison with State Industrial Directories

This task was completed for two counties, Bergen County (NJ) and Nassau County (NY). Section 2.2 and Table 2-2 present the information on Bergen County, while Section 3.2 and Table 3-2 present the corresponding information on Nassau County.

Some exploratory investigation was done prior to the tabulation of facilities provided in Sections 2.2 and 3.2, mainly for the purpose of developing criteria for selecting firms from the State Industrial Directory for further scrutiny as possible pollutant sources. This preliminary work, done with the New York State Industrial Directory,* is described in the following subsections.

1.3.1.2.1 Preliminary Comparisons

In an attempt to ascertain whether the AIR-100 emission inventory provided substantially complete coverage of point sources which might be expected to emit hydrocarbons (VOC's) and oxides of nitrogen (NO_x), PES compared lists of facilities found in the emission summary (ES) with lists derived from the "1980 New York State Industrial Directory" (SID).*

Initial review showed that the scope of the SID is more restricted than that of the inventory, since the SID is devoted almost exclusively to businesses in Standard Industrial Classification (SIC) categories between 2000 and 3999, the manufacturing industries, while the emission inventory covered facilities in categories from 0219 to 9531. In particular, large emission sources not covered by the SID include power plants and bulk gasoline terminals. Further, the initial review showed that SIC categories assigned in the SID often differed from those assigned in the AIR-100 inventory to the same facilities.

Thus, of nine major emitting facilities in Nassau County, as identified in the inventory, two (bulk gasoline terminals) were not found in the SID, while four were found under alternate SIC numbers and only three had the same SIC categories in both lists. An

*Published by State Industrial Directories Corp., Wm. Penn Plaza, New York, NY 10001.

example of the differences encountered is offered by Cellucraft, Inc. AIR-100 shows this plant as Facility 0468, address 1403 Fourth Ave., New Hyde Park, and describes the processes as "flexographic printing using Kidder flexographic presses; solvent and water based inks ... dual drying system...," giving it SIC number 2643. The SID gives the address as 1401 4th Ave., New Hyde Park 11040 and describes the business as "flexible packaging designers, printers, converters, laminators, films, foils, paper," giving it SIC numbers 3079, 3573, and 3497. The official descriptions of the SIC numbers are as follows:

2643, Bags, except textile bags
3079, Miscellaneous plastics products
3479, Metal foil and leaf
3573, Electronic computing equipment

In the SID, this Cellucraft facility is listed once in the statewide alphabetical list, once in the geographical list for Nassau County, and three times in the classified list (once for each of the assigned SIC numbers). The listing under Nassau County yields the most specific information, including the telephone number, the area of the facility (90,000 square feet) and the employment (98).

As a further test of the consistency of information between AIR-100 and the SID, PES selected a category from the classified section of the SID (namely, SIC 2891: Adhesives and Sealants), identified those firms located in the nine-county metropolitan area, and searched the ES to determine whether it included each of these facilities. Thirty-one such firms were found in the SID, of which only five could be found in the ES. None of these facilities were identified by SIC 2891 in AIR-100; the SIC numbers assigned were 2821, 2899, 3069, 3714, and 3993. Thus, it is clear that SIC numbers cannot be used as a consistent index in comparing the AIR-100 and SID lists.

Since the AIR-100 inventory includes relatively few manufacturing facilities (actually, a total of 33) in the inner counties, it was of interest to check the SID to determine whether it listed larger numbers of such facilities. PES selected 12 SIC categories (in the manufacturing range) which corresponded to probable emitting industries, and checked the numbers of firms indicated in the five inner counties in these categories in the SID. The results were as follows:

SIC number and category	No. of firms
2295, various coated fabrics	10
2621, paper mills	18
2631, paperboard mills	2
2754, commercial printing, gravure	9
2821, plastics materials, etc.	14
2834, pharmaceutical preparations	30
2851, paints, varnishes, etc.	58
2891, glue and gelatin*	19
2899, chemicals and chemical preparations	36
2911, petroleum refining	12
3041, rubber and plastics hose and betting	3
3479, coating, engraving, etc.	22
TOTAL	233

Since the number of firms found in this small selection of categories is eight times the total of all manufacturing firms included in the AIR-100 inventory, we conclude that the total of all manufacturing firms in these counties is probably greater than the number listed in the inventory by a factor of 20, and probably much more.

*The SID identifies this category as "Adhesives and Sealants."

A similar test was made in relation to the outer counties (Nassau, Suffolk, Rockland, and Westchester), with the result that 165 firms were identified in the SID, of which 29 (18 percent) were found in the AIR-100 emission summary. This indicates, in accord with information from NYSDEC, that the coverage of point sources in the inventory for the outer counties may be substantially more complete. The discrepancy is still large, however, even in these counties.

1.3.1.2.2 Criteria for Systematic Search of the State Industrial Directories

These preliminary results warrant the conclusion that the SID names many firms, in potentially polluting industries, which are not incorporated in the AIR-100 point source inventory. It does not follow, however, that the AIR-100 inventory is seriously incomplete with regard to major emitting facilities.

In the first place, most of the firms named in the SID are relatively small firms, to judge by the numbers of employees cited (in the geographical listings). Second, the Standard Industrial Classification system permits the inclusion of both non-emitting and emitting facilities under the same code number, since the classification indicates only the type of product involved rather than any specific information about raw materials, processes, or emissions. Third, there is an inherent factor of arbitrary choice in the assignment of an SIC category to a facility, at least in many cases, as shown by the fact that the SID lists a rather large proportion of its firms by two or more SIC categories. Thus, it appears that a rather large proportion of the facilities listed in the SID, even in the categories for potentially emitting industries, may in fact have zero or negligible emissions of VOC and NO_x.

In an attempt to define more narrowly the SID firms which might be considered candidates for scrutiny as possible major emission

sources omitted from the AIR-100 emissions inventory, PES decided to focus only on firms having at least 100 employees, and belonging to SIC categories already found in AIR-100 to include some major facilities, or to be closely related to such categories. Using these criteria, PES searched the SID for conforming firms, then searched the emissions inventory to determine whether their facilities were already included. For this test, the counties of Nassau (in New York) and Bergen (in New Jersey) were selected.

The 100-employee cutoff was deemed to be reasonable for several reasons. First, it simplified the task of scanning the geographical listings, since three-digit employment would qualify, while two digits would not. Second, it appeared that only about one firm in 20 would qualify, which would constitute a substantial winnowing of the complete, lengthy list of firms in the SID. Third, few firms having less than 100 employees would be expected to exceed 100 tons per year of VOC emissions, based on Emission-per-Employee Ranges reported in EPA-450/2-77-008.*

The SIC categories selected for retrieval are shown in Table 1-1.

1.3.1.2.3 Results of the Search and Comparisons

Results obtained for these two counties were substantially similar. For Nassau county, the SID yielded 112 firms, of which 34 (30 percent) were found in the AIR-100 summary and 78 were not. For Bergen county, the SID yielded 154 firms, of which 50 (33 percent) were found in the NJDEP Emission Summary and 104 were not.

---

*Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds, Volume I, Second Edition, p. 3-5.

Table 1-1. SIC CATEGORIES INCLUDED IN INDUSTRIAL DIRECTORY SEARCH

SIC code	and Category[a]
203X	Canned and preserved fruits and vegetables
2051	Bread and other bakery products
2076	Vegetable oil mills
2077	Animal and marine fats and oils
208X	Beverages
209X	Miscellaneous food preparations
2231	Broad woven fabric mills
226X	Dyeing and finishing textiles
227X	Floor covering mills
2295	Artificial leather, oilcloth, etc.
2297	Wool scouring, worsted combing, etc.
2435	Hardwood veneer and plywood
2492	Particleboard
262X	Paper mills, except building paper mills
263X	Paperboard mills
264X	Converted paper and paperboard products
265X	Paperboards boxes and containers
275X	Commercial printing
28XX	Chemicals
29XX	Petroleum
30XX	Rubber and plastics
321X	Flat glass
322X	Glass and glassware, pressed on blown

[a]Where only two or three digits are given, followed by X or XX, the entire subgroup or major group indicated was included (for retrieving facility names).

Table 1-1. SIC CATEGORIES INCLUDED IN INDUSTRIAL DIRECTORY SEARCH (CONCLUDED)

SIC code	and Category[a]
329X	Abrasive, asbestos, etc. (mineral products)
333X	Primary smelting and refining, nonferrous
3341	Secondary smelting and refining, nonferrous
3357	Drawing and insulating nonferrous wire
341X	Metal cans and shipping containers
3429	Hardware
3443	Fabricated plate work
3444	Sheet metal work
3469	Metal stampings
3489	Ordnance and accessories
349X	Miscellaneous fabricated metal products
3549	Metalworking machinery
3552	Textile machinery
3555	Printing trades machinery and equipment
3589	Service industry machines
3643	Current carryirg wiring devices
3652	Phonograph records
3679	Electronic components and accessories
3699	Electrical machinery, equipment and supplies
371X	Motor vehicles and motor vehicle equipment
372X	Aircraft and parts
373X	Ship and boat building and repairing
374X	Railroad equipment
3861	Photographic equipment and supplies

Of the 34 Nassau County firms which met the employment and SIC criteria for retrieval from the SID and which were identified in the AIR-100 inventory, only five (14 percent) were shown as having emissions greater than 100 tons per year of HC or NO_x. Of the four major emitters in Nassau County identified in the inventory but not retrieved in the search, two were in the SID but below the employment search cutoff of 100, while the other two were bulk gasoline terminals (not manufacturing facilities) and therefore did not appear in the SID. If, hypothetically (although this is very improbable), all of the 78 firms from the search which were not in the inventory had the same distribution of emissions as the 34 which were in the inventory, then 11 of the 78 should be major emitters.

Actually, of course, it is not certain that any of the 78 search-retrieved firms emits VOC or NO_x in any quantity. However, they do compose a logical set of candidate firms which should be reviewed to determine, from more specific information, whether any of them in fact belong in the AIR-100 inventory for Nassau County. The names, addresses, and employment figures of these firms are listed in Table 3-2.

1.3.1.2.4 Conclusions and Recommendations

Sample searches of the State Industrial Directories for New York and New Jersey show that these directories list many firms, under SIC classifications which suggest that they are potential emitters of VOC and NO_x, which are not included in the emission inventories of those states.

We recommend that NYSDEC and NJDEP undertake to contact a significant sample, such as ten percent, of the firms listed in Tables 4 and 5, to determine how many of them (if any) are indeed emitters of VOC or NO_x which should be added to the existing point source inventories. If the number of such firms or the total of

emissions from such firms is more than a negligible fraction, say five percent, of the number already incorporated in the inventory, then the remaining counties in each state should be similarly studied.

1.3.1.3 Review of Methodologies for Minor Point Sources

PES reviewed documentation from both New Jersey and New York (see Section 1.2) to determine and critique the methods described or implied by the narrative furnished. Findings and conclusions in relation to New Jersey are presented in Section 2.3; those relating to New York are given in Section 3.3. Each state's documentation was insufficient to permit PES to recommend full acceptance of the indicated procedures, for reasons explained in Sections 2.3 and 3.3, respectively.

1.3.1.4 Compilation of Employment Figures by SIC Category

Neither the New Jersey point source inventory listing (in EIS/P&R format) nor the New York AIR-100 printout contained employment information for the facilities inventoried. Lacking such information, Task 1d was suspended.

1.3.1.5 Review of Point-Source Emissions Estimates

The original intention of PES in relation to Task 1e was to review the detailed calculations supporting the emissions estimates, as found in the point-source emissions inventories, for a significant sample of the major point sources. Preliminary review, however, showed that nether inventory consistently contained all information necessary to confirm the VOC and NO_x emissions estimates as presented. PES therefore devised alternative stratagems for judging the plausibility and self-consistency of the emissions estimates, where possible. Section 2.4 discusses these

tests and PES findings in relation to the New Jersey inventory; Section 3.4 discusses the corresponding information for New York. Conclusions and recommendations for the respective states are also given in those Sections.

1.3.1.6 Review of Methodologies for Major Point Sources

Task 1f was intended to provide for review of state documentation relating to methodology for estimating emissions, including the estimation of activity levels, fraction of nonreactive VOC components, seasonal and weekday adjustments, and efficiencies of control equipment.

The State of New Jersey furnished no documentation which dealt with these aspects of the point source inventory. According to a letter of April 1, 1981, from Herbert Wortreich, assistant director of NJDEP's Division of Environmental Quality, to William B. Baker of EPA's Region II, a separate quality assurance check of the point source inventory was already under way at that time, with participation by the Bureau of Air Pollution Control Operations and the Bureau of Air Quality Management and Surveillance. PES was therefore unable to address this aspect of the New Jersey point source inventory.

Documentation initially provided by NYSDEC proved to be insufficient for a critical review of point source methodology. When this deficiency was pointed out, NYSDEC forwarded additional information relating to air pollution rules and regulations and the structure of the AIR-100 system. These additional documents provided a more extensive outline of the system used by NYSDEC to grant permits for construction and operation of industrial emission sources. The PES review of this system is presented in Section 3.5; it does not cover the estimation of activity levels, fractions of

nonreactive VOC's, or temporal adjustments, as these matters were not addressed in the documentation.

1.3.1.7 Computer-Based Edit-Checks

Task 1g directed PES to undertake to apply EPADAS, a data-quality edit-check system, for estimating the quality of the point source inventory data. However, since EPADAS operates only on data supplied in EIS/P&R format, it was not applicable to New York's AIR-100 file. Further, initial review indicated that the information recorded in New Jersey's point source emissions file, resulting from NJDEP's APEDS-to-EIS conversion system, was quite incomplete, so that application of EPADAS would probably not be very useful. With the concurrence of the Project Officer, this task was suspended.

1.3.2 AREA-SOURCE DATA QUALITY AUDITS

1.3.2.1 Review of Area-Source Methodologies

Narratives describing area-source methodologies were provided by NJDEP and NYSDEC in the initial project documentation (refer to Section 1.2). PES reviewed these narratives to determine whether they included all of the standard area-source categories called for in EPA's guidance document, "Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds, Volume I," EPA-450/2-77-028 (Second Edition, September 1980). The report of this review in relation to New Jersey inventories is presented in Section 2.5; the similar review for New York appears in Section 3.6.

In general, both state agencies were responsive to the guidance document. Area-source categories named in the document are listed in Table 1-2; these are the same categories used by the states, with only minor exceptions, which are explained in the sections previously cited.

Table 1-2. SOURCE, EPA-450/2-77-028, "PROCEDURES FOR THE PREPARATION OF EMISSION INVENTORIES FOR VOLATILE ORGANIC COMPOUNDS, VOLUME I," SECOND EDITION, SEPTEMBER 1980.

Evaporative Loss -

Gasoline Service Stations (and other outlets)
- Tank truck unloading (Stage I)
- Vehicle fueling (Stage II)
- Storage tank breathing losses

Solvent Users
- Degreasing, small industrial/commercia
- Drycleaning
- Surface coatings
  - Architectural
  - Auto body refinishing
  - Other small industrial
- Graphic arts
- Commercial/consumer solvent use
- Cutback asphalt
- Pesticides

Combustion

Highway Mobile Sources
- Light duty vehicles (LDV)
- Light duty gasoline powered trucks 6,000 lb (LDT1)
- Light duty gasoline powered trucks 6,000-8,500 lb (LDT2)
- Heavy duty gasoline powered trucks (HDG)
- Heavy duty diesel powered trucks (HDD)
- Motorcycles

Stationary Source Fossil Fuel Combustion (by fuel type)
- Residential
- Commercial/institutional
- Industrial

Non-highway Mobile Sources
- Aircraft (Military, civil, commercial)
- Railroad locomotives
- Vessels
- Off-highway vehicles

Solid Waste Disposal
- Onsite incineration
- Open burning
- Structural fires
- Field/slash/forest fire burning

1.3.2.2 Review of Area-Source Factors and Computations

PES reviewed the area-source factors (for seasonal adjustment, weekly activity, VOC composition and per-capita emissions) as reported in the area-source documentation, and performed calculations to confirm the emission estimates given in the states' area source inventories. Findings in relation to the New Jersey inventory are presented in Section 2.6, while the corresponding information for New York is given in Section 3.7. PES found numerous discrepancies or information gaps in each state's inventory; these are discussed in the sections cited.

2.0 NEW JERSEY AUDIT

2.1 COMPARISON WITH RACT DIRECTORY

The plants named in Table 2-1 are listed in "Directory of Volatile Organic Compound Sources Covered by Reasonably Available Control Technology (RACT) Requirements, "Volumes I, II, and III (EPA-450/4-80-007 a, b, c, respectively) as existing in various counties of the State of New Jersey. They were, however, not found by PES in a computer listing of major point sources of VOC emissions in New Jersey, provided by Engineering-Science on behalf of the New Jersey Department of Environmental Protection, labeled "HC and NO_x emission summaries for all sources (HC or NO_x) greater than or equal to 100 tons per year for all of the New Jersey Counties."

Some of the names of firms in the list below are similar to names of facilities which can be found in a separate computer listing, labeled "TSP, SO_2, CO, NO_x and HC emissions summaries by point and plant for all New Jersey Counties." Since that listing includes many minor sources and does not provide addresses or other location information, it was not compared in detail with the RACT Directory.

2.2 COMPARISON WITH STATE INDUSTRIAL DIRECTORY

In an attempt to ascertain whether New Jersey's emissions inventory provided substantially complete coverage of major point sources which might be expected to emit hydrocarbons (VOC's) and oxides of nitrogen (NO_x), PES compared the list of facilities found in the New Jersey emissions summary with a list of firms meeting certain criteria, found in the "1980 New Jersey State Industrial Directory" (SID).* Firms found in the SID list but not

*Published by State Industrial Directories Corp., Wm. Penn Plaza, New York, NY 10001.

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES

GROUP I RACT CATEGORIES

AUTOMOBILE AND LIGHT-DUTY TRUCK SURFACE COATING PLANTS

Middlesex County

Ford Motor Co., Metuchen Assembly Plant, P.O. Box F, Edison 08817

CAN SURFACE COATING PLANTS

Cumberland County

Continental Can Co., 502 W. Elmer Road, Vineland 08360

Essex County

Peerless Tube Co., 58-76 Locust Avenue, Bloomfield 07003

Gloucester County

Del Monte Corp., Plant No. 505, Locke Ave. & Auburn St., Swedesboro 08085

Hudson County

American Can Co., Canco Division, 12th & Hudson Streets, Hoboken 07030
Crown Cork & Seal Co., Inc., 7101 Tonnelle Ave., North Bergen 07047

Middlesex County

American Can Co., Old George Road, New Brunswick 08902
American Can Co., 3 Kilmer Road, Edison 03817
American Can Co., Corn Road, P.O. Box 269, Dayton 08810
Kaiser Aluminum & Chemical Corp., Edison Can Plant, 24 Kilmer Road, Edison 08817
Milton, George A. Can Co., Applegorris Road, Cranbury 08512
National Can Corp., 135 National Road, Edison 08817
National Can Corp., South Randolphville Road, Route 287, Piscataway 08854
Reynolds Metals Co., 433 Blair Road, Avenel 07001
United Steel Container Corp., 1202 Airport Road, New Brunswick 08902

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

CAN SURFACE COATING PLANTS (CONTINUED)

Passaic County

Allstate Can Corp., Isabella Street, P.O. Box 588, Clifton 07011
Atlantic Can Co., 101 Seventh Street, Passaic 07055
Continental Can Co., 297 Getty Avenue, Paterson 07503
Continental Can Co., 217 Brook Avenue, Passaic 07055
Continental Can Co., 20 Continental Road, Wayne 07470

Union County

American Can Co., 600 N. Union Avenue, Hillside 07205
Van Dorn Co., Milton, George A. Can Co., 580 Division Street, Elizabeth 07201

Warren County

American Can Co., Route 31, Washington 07882

Morris County

Arrow Group, 100 Alexander Avenue, Pompton Plains 07444

FABRIC SURFACE COATING PLANTS

Bergen County

Aegis Textile, Inc., 1 Passic Street, Wood-Ridge 07075
Siltex/Silna Corp., 7 Capital Drive, Moonachie 07074
Stacy Fusible Fabrics Corp., 38 Passaic Street, Wood-Ridge 07075

Essex County

Stonehenge Processing Co., 134 Sand Park Lane, Cedar Grove 07009

Mercer County

Kay Line, Inc., 31 Coats Street, Trenton 08611

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

FABRIC SURFACE COATING PLANTS (CONTINUED)

Morris County

Pantasote Co., 250 Hamburg Turnpike, Butler 07405

Passaic County

Applikay Textile Process Corp., 35 8th Street, Passaic 07055
Brewster Finishing Co., 4th Avenue, McLean Boulevard, Paterson 07514
Como Textile Prints, Inc., 191 East Railroad Avenue, Paterson 07503
Congress Textile Printers, 179 Goffle Road, Hawthorne 07506
Craft Textile Printing Co., 44 Beech Street, Paterson 07059
D & S Processing Co., 100 Grunwald, Clifton 07015
Dove Processing Co., 55 Westervalt Avenue, Hawthorne 07056
Kroll, Boris, Jacquard Looms, 66 Gray Street, Paterson 07501
Missbrenner Prints, 211 Mount Prospect Avenue, Clifton 07013
Roma Print, 55 First Avenue, Paterson 07514
Sterling Creative Textile Printers, 41 Beach St., Paterson 07501

LARGE APPLIANCE SURFACE COATING PLANTS

Camden County

Hussman Refrigerator Co., Woodcrest Road, Cherry Hill 08002

METAL FURNITURE SURFACE COATING PLANTS

Essex County

Butler Ind., 637 Central Avenue, Newark 07107
Handy Mfg. Co., Handy Store Fixtures, 337 Sherman Ave., Newark 07114
Stacor, Inc., 285 Emmett Street, Newark 07114

Hudson County

Levoler Lorentzen, Inc., 720 Monroe Street, Hoboken 07030

Monmouth County

Estey Corp., Wayside & Shafto Road, Kinton Falls 07724

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

METAL FURNITURE SURFACE COATING PLANTS (CONTINUED)

Union County

Jacobson & Co., Inc., 1079 E. Grand Street, Elizabeth 07201

MAGNET WIRE SURFACE COATING PLANTS

Bergen County

Daburn Electrical and Cable, 1703 Oak Street, Norwood 07648

Monmouth County

Molecu Wire Corp., P.O. Box 495, Farmingdale 07727

PAPER PRODUCTS SURFACE COATING PLANTS

Essex County

Norpak Corp., 70 Blanchard Street, Newark 07105

Middlesex County

Avery Prods. Corp., Avery Label Sys., 1385 Livingston, North Brunswick 08902
Permacel, U.S. Highway 1, P.O. Box 671, North Brunswick 08903

Monmouth County

Laminating Corp. of America, 611 Industrial Way W., Eatontown 07724

Union County

General Gummed Products, Inc., 531 North Stiles Street, Linden 07036

Warren County

Flock Industries, Inc., 259 Center Street, Phillipsburg 08865

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

GROUP II RACT CATEGORIES

PETROLEUM REFINERIES

Gloucester County

Seaview Petroleum Co., P.O. Box 1100, Paulsboro 08066

Union County

Exxon Co., USA, P.O. Box 222, Linden 07036

CHEMICAL SYNTHESIS PHARMACEUTICAL MANUFACTURING PLANTS

Bergen County

Aceto Chemical Co., Inc., P.O. Box A, Carlstadt 07072
Ganes Chemicals, Inc., 611 Broad St., Carlstadt 07072
Hexcel Corp., 205 Main Street, Lodi 07644
Penick, F.B. Corp., 1050 Hall Street W., Lyndhurst 07071
Tenneco Chemicals, Inc., 290 River Drive, Garfield 07026

Essex County

Norda, Inc., 55 Virginia Street, Newark 07114

Hudson County

Diamond Shamrock Corp., First and Essex Streets, Harrison 07029
N. L. Industries, Inc., 40 Avenue A, Bayonne 07002

Mercer County

Sterling Drug, Inc., 2144 E. State Street, Trenton 08619

Middlesex County

Hummel Chemical Co., 10 Harmich Road, South Plainfield 07080
Rhone-Paulenc, Inc., P.O. Box 2009, New Brunswick 08903

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

CHEMICAL SYNTEHSIS PHARMACEUTICAL MANUFACTURING PLANTS (CONTINUED)

Passaic County

Calgon Corp., P.O. Box 6, 200 Wagaraw Road, Hawthorne 07507
Miles Laboratories, Inc., P.O. Box 1819, Clifton 07015

Salem County

Ganes Chemicals, Inc., Industrial Park Route, Pennsville 08070

Somerset County

American Cyanamid, West Main Street, Bound Brook 08805

PNEUMATIC RUBBER TIRE MANUFACTURING PLANTS

Camden County

Super Tire Engineering Co., 7255 Crescent Boulevard, Pennsauken 08110

Hunterdon County

Oliver Tire and Rubber Co., 43 Emery Avenue, Flemington 08822

FLATWOOD PANELING SURFACE COATING PLANTS

Camden County

Predco Precision Panels, 3900 River Road, Pennsauken 08110

INDUSTRIAL PERCHLOROETHYLENE DRYCLEANERS

Bergen County

Bon Ton Cleaners & J.J.F., 45 S. Broad, Ridgewood 07450

Burlington County

Crown Enterprises, Inc., 22 Scott, Riverside 08075

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

INDUSTRIAL PERCHLOROETHYLENE DRYCLEANERS (CONTINUED)

Camden County

D & A Cleaners, 222 N. Centre, Merchantville 08109
Dutch Cleaners & Dyers, Inc., 27 E. Kings Highway, Audubon 08106

Mercer County

Ramp Drycleaning, Inc., Princeton & U.S. Hwy 130, Princeton 08540
Sanitary Cleaners, Southard & Burton, Trenton 08638

Monmouth County

Tops N. Town, Inc., 145 South Street, Freehold 07728

Union County

Columbia Cleaners, Inc., Chatham Road, Summit 07901
Keller, G. O., Inc., 1201 South Avenue, Plainfield 07062

PACKAGING ROTOGRAVURE AND FLEXOGRAPHIC PRINTING COMPANIES

Bergen County

Devon Tape Corp., 649 S. Commercial Avenue, Carlstadt 07072
Gravure Flex Packaging Corp., 100 Wesley Street, South Hackensack 07606
Patton Industries, Inc., Division of Alford Industries, 18 Central Boulevard, South Hackensack 07606
Stephen, Lawrence, Co., 41 Mount Vernon Street, Ridgefield Park 07660

Burlington County

Modern Packaging, Inc., Shreve Street, P.O. Box 158, Mount Ho-ly 08060

Camden County

Wise Tag and Label Co., 7035 Central Highway, Pennsauken 08109

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

PACKAGING ROTOGRAVURE AND FLEXOGRAPHIC PRINTING COMPANIES (CONTINUED)

Essex County

Eskimo Pie Corp., Subsidiary of Reynolds Metals Co., 118 John F. Kennedy Drive, N., Bloomfield 07003
Lawrence Packaging Supply Corp., 113 N. 13th St., Newark 07107
Norpak Corp., 70 Blanchard Street, Newark 07105
United Label Corp., 65 Chambers Street, Newark 07101

Hudson County

Gould, Stephen, Paper Co., Inc., Gould Street, Bayonne 07002

Middlesex County

Avery Label, 1385 Livingston Avenue, North Brunswick 08902
Champion-Edison, Inc., Raritan Center Parkway, Edison 08817
Ronnie Packaging Corp., 4301 New Brunswick Avenue, South Plainfield 07080

Monmouth County

Zorn Packaging, Inc., P.O. Box 358, Rt. 34 Near 33 Wall Township, Farmingdale 07727

Morris County

Dairypak, Division of Champion International, 155 E. Hanover Avenue, Morristown 07968

Passaic County

Acme Engraving Co., Inc., 19-37 Delaware Avenue, Passaic 07055
Oneida Packaging Products, Inc., 10 Clifton Boulevard, Clifton 07015
Standard and Packaging Corp., 1 Lisbon Street, Clifton 07013
Union Camp Corp., Folding Carton and Label Division, 800 State Highway 3, Clifton 07012

Somerset County

Egan, A. Leesona Co., S. Adamsville Road, Somerville 08876

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

PACKAGING ROTOGRAVURE AND FLEXOGRAPHIC PRINTING COMPANIES (CONTINUED)

Union County

Gentech Industries, Inc., 531 N. Stiles Street, Linden 07006

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

GROUP III RACT CATEGORIES

FABRIC PRINTING PLANTS

Bergen County

Aegis Textile, 1 Passaic Street, Wood Ridge 07075
Stacy Fusible Fabrics Corp., 38 Passaic Street, Wood Ridge 07075

Essex County

Stonehenge Processing, 134 Sand Park Road, Cedar Grove 07009

Passaic County

A. T. P. Processors Ltd., 1 Van Houten Street, Paterson 07505
Applikay Textile Process Corp., 35 8th Street, Passaic 07055
Brewster Finishing Co., 4th Avenue, McLean Boulevard, Paterson 07509
Como Textile Prints, Inc., 191 E. Railway Avenue, Paterson 07503
Congress Textile Printers, Inc., 179 Groffle Road, Hawthorne 07506
Craft Textile Printing, P.O. Box 2761, Paterson 07509
D & S Processing Co., Inc., 100 Grunwald Street, Clifton 07013

FABRIC PRINTING PLANTS

Passaic County

Roma Printing & Finishing Corp., 55 First Avenue, Paterson 07514

POLYMER AND RESIN MANUFACTURING PLANTS

Bergen County

Stacy Fusible Fabrics Corp., 38 Passaic Street, Wood Ridge 07075

Gloucester County

Shell Chemical Co., P.O. Box 700, Woodbury 08096

Mercer County

Sterling Plastics Corp., Subsidiary of Cosden Oil & Chemical Co., Main Street, Windsor 08561

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

NATURAL GAS PROCESSING PLANTS

Union County

Elizabethtown Gas Co., Elizabeth 07201

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS

Atlantic County

Scholler Brothers, Inc., Elwood-Weymouth Road at 2nd Street, Elwood 08217

Bergen County

Arsynco, Inc., Division of Aceto Chemical Co., Inc., P.O. Box 8, Carlstadt 07072
Chemical Products Corp., 125 Main Street, Elmwood Park 07407
Crompton & Knowles Corp., Route 208, Fair Lawn 07410
Diamond Shamrock Corp., 13th Street and Berry Avenue, Carlstadt 07072
Finetex, Inc., 418 Falmouth Avenue, Elmwood Park 07407
Great Northern Paint & Chemical Corp., East Paterson 07407
Lever Brothers Co., 101 River Road, Edgewater 07020
Mallinckrodt, Inc., Lodi 07644
Millmaster Onyx Group, Division of Gulf Oil Corp., 524 Schuyler Ave., Lyndhurst 07071
Norac Co., Inc., 169 Kennedy Drive, Lodi 07644
Sybron Corp., Page and Schuyler Avenues, Lyndhurst 07071
Tenneco, Inc., Mahor Road, East Rutherford 07073
Tenneco, Inc., Garfield 07026
UOP, Inc., State Highway N. 17, East Rutherford 07073

Burlington County

National Casein of New Jersey, P.O. Box 266, Riverton 08077
Ruco, Burlington 08016
Sybron Corp., P.O. Box 66, Birmingham 08011
Tenneco, Inc., P.O. Box 116, Beverly Road, Burlington 08016
Wall Industries, Inc., P.O. Box G, Beverly 08010

Camden County

Matthey Bishop, Inc., Winslow 08095
Osborn, C. J., Chemicals, Inc., 820 Sherman Ave., Pennsauken 08110
Owens-Corning Fiberglass Corp., P.O. Box 8, Barrington 08007

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS (CONTINUED)

Essex County

Adco Chemical Co., Inc., Delancey and Rutherford Streets, Newark 07105
Arkansas Co., Inc., 185 Foundry Street, Newark 07101
Armitage, John L., & Co., 239 Thomas Street, Newark 07114
Arol Chemical Products Co., 649 Ferry Street, Newark 07105
Ashland Oil, Inc., 400 Doremus Avenue, Newark 07105
AZS Corp., 660 Frelinghuysen Avenue, Newark 07114
Benjamin Moore & Co., 134 Lister Avenue, Newark 07105
Cellomer Corp., Division of Polychrome Corp., Newark 07105
Continental Oil Co., 191 Doremus Avenue, Newark 07105
Crest Chemical Corp., 225-235 Emmett Street, Newark 07114
Fairmount Chemical Co., Inc., 117 Blanchard Street, Newark 07105
Great Northern Paint & Chemical Corp., 40 Industrial Rd., Lodi 07644
Hardman, Inc., 600 Cortlandt Street, Belleville 07109
Millmaster Onyx Group, Division of Gulf Oil Corp., Newark 07105
Onyx Oils & Resins, Inc., 193 Christie Street, Newark 07105
Orbis Products Corp., Division of Morda, Inc., 55 Virginia St., Newark 07114
Sherwin-Williams Co., Brown St. and Lister Ave., Newark 07105
Textron, Inc., 400 Doremus Avenue, Newark 07105
Xcel Corp., Newark 07105

Gloucester County

Hercules, Inc., Gibbstown 08007
Pennwalt Corp., Thorofare 08086
Shell Chemical Co., P.O. Box 700, Woodbury 08096

Hudson County

City Chemical Crop., 100 Hoboken Avenue, Jersey City 07302
Colgate-Palmolive Co., 105 Hudson Street, Jersey City 07302
Degen Oil & Chemical Co., 200 Kellogg Street, Jersey City 07302
Hart Products Corp., 173 Sussex Street, Jersey City 07302
Lawter Chemicals, Inc., 24 Jacobus Avenue, South Kearny 07032
Mallinckrodt, Inc., 223 W. Side Avenue, Jersey City 07303
Mobay Chemical Corp., 169 W. 52nd Street, Bayonne 07002
Monsanto Co., Pennsylvania Avenue, Kearny 07032
Standard Chlorine Chemical Co., Inc., 1035 Belleville Turnpike, Kearny 07032
Syncon Resins, Inc., 77 Jacobus Avenue, South Kearny 07023
Union Oil Co. of California, 100 Third Avenue, Kearny 07032
White Chemical Corp., P.O. Box 278, Bayonne 07002

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS (CONTINUED)

Hunterdon County

Magnesium Elektron, Inc., Star Route A, P.O. Box 202-1, Flemington 08822

Mercer County

Sterling Drug, Inc., 2144 E. State Street, Trenton 08607
Sterling Plastics Corp., Division of American Petrofina, Windsor 08561
United States Gypsum, 1000 Nottingham Way, Trenton 08609

Middlesex County

American Cyanamid Co., P.O. Box 8, Woodbridge 07095
Ashland Oil, Inc., Meadow Road, Fords 08863
AZS Corp., Sayreville 08872
C.P. Chemicals, Inc., Sewaren 07077
Chemical & Pollution Sciences, Inc., Old Waterworks Road, Old Bridge 08857
Essex Chemical Corp., 1 Crossman Road, S., Sayreville 08872
Fuller, H.B., Co., P.O. Box 987, Edison 08817
Grace, W.R., & Co., Fords 08863
Hummel Chemical Co., Inc., P.O. Box 250, South Plainfield 07080
Interstab Chemicals, Inc., 500 Jersey Avenue, New Brunswick 08903
Pilot Laboratories, Inc., 267 Homestead Avenue, Avenel 07001
Witco Chemical Corp., 1000 Convery Boulevard, Perth Amboy 08861

Morris County

Fritzsche Dodge & Olcott, Inc., Merry Lane and Passaic Avenue, East Hanover 07936
Norda, Inc., Fanny Road, Boonton 07005
Smooth-On, Inc., 1000 Valley Road, Gillette 07933
Tenneco, Inc., Rockaway 07866

Ocean County

Ciba-Geigy Corp., Toms River 08753
Rhone-Poulenc, Inc., Lakewood 08701
Toms River Chemical Corp., P.O. Box 71, Toms River 08753

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS (CONTINUED)

Passaic County

American Polymers, Inc., 50 California Avenue, Paterson 07503
Commercial Products Co., 117 Ethel Avenue, Hawthorne 07507
Conco Products, Clifton 07015
Givaudan Corp., 100 Delawanna Avenue, Clifton 07014
H & N Chemical Co., 90 Maltese Drive, Totowa 07512
Pantasote, Inc., 26 Jefferson Street, Passaic 07055
Richardson Co., 100 New Street, Paterson 07509
Sybron Corp, 59 Lee Ave., Haledon 07508
Ungerer & Co., Inc., 650 Union Boulevard, Totowa 07512
Witco Chemical Corp., 2 Wood Street, Paterson 07524
Woburn Chemical Co., 190 9th Avenue, Paterson 07504

Salem County

E. I. duPont De Nemours and Co., Inc., Carneys Point 08069

Somerset County

Blue Spruce Co., Bound Brook 08800

Sussex County

United Foam Corp., Munsonhurst Road, P.O. Box 266, Franklin 07416

Union County

Allied Chemical Corp., P.O. Box 18, Elizabeth 07201
Apex Chemical Co., Inc., 200 S. First St., Elizabethport 07206
Celanese Polymer Specialties Co., Linden 07036
Dock Resins Corp., 1512 W. Elizabeth Avenue, Linden 07036
Emkay Chemical Co., 319-325 Second Street, Elizabeth 07206
Millmaster Onyx Group, Division of Gulf Oil Corp., P.O. Box 71, Linden 07036
National Starch and Chemical Corp., 1735 W. Front Street, Plainfield 07063
Reichhold Chemicals, Inc., 726 Rockefeller Street, Elizabeth 07202
Shanco Plastics & Chemicals, Division of Synres Chemical Corp., Kenilworth 07033
Synres Chemical Corp., Kenilworth 07033
United States Steel Corp., 1711 Elizabeth Avenue, W., Linden 07036

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS (CONTINUED)

Warren County

Baker, J.T., Chemical Co., 600 N. Broad Street, Phillipsburg 08865
BASF Wyandotte Corp., P.O. Box 209, Washington 07882

BULK GASOLINE TERMINALS

Atlantic County

Seaboard Oil Co., Absecon Boulevard, Atlantic City 08084

Bergen County

Exxon Terminal, S. River Street, Hackensack 07602
GATX (Phillips), 78 Lafayette Street, Carteret 07008
Metro Oil & Chemical Co., 343 S. Broad Street, Ridgefield 07657
Stoney Mueller, Inc., Page & Schuyler, Lyndhurst 07071

Camden County

Amerada Hess, 1 Derousse Avenue, Pennsauken 08110
Atlantic Richfield Co., Foot of Water Street, Gloucester City 08030
Camden Department of Public Works, 12th & Federal, Camden 08101
Federal Oil of New Jersey, 1435 River Road, Camden 08101
Koch Fuels, Inc., 3rd Street & Water, Gloucester City 08030

Essex County

Atlantic Richfield Co., 1111 Delancy Street, Newark 07101
Coastal Oil Co., Newark 07101
Port Authority of New York, Newark 07101
Q Petroleum, Inc., 101 Riverside Avenue, Newark 07104

Gloucester County

Arco Terminal, Crownpoint Road, West Deptford 08086
Colonial Pipeline Co., Mantua Grove Road, West Deptford 08086
Gulf Oil/Terminal, Salem Pike & Jessup, Woodbury 08096

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

BULK GASOLINE TERMINALS (CONTINUED)

Hudson County

Amerada Hess, Lower Hook Road, Bayonne 07002
Columbia Terminals, South Kearny 07032
Hess Oil Co., Secaucus 07094
Kenrich Petrochemicals Co., Foot of E. 22nd St., Bayonne 07002
Metropolitan Petroleum, Jersey City 07303
Tilcom Warren, Inc., 1611 Paterson Plank, Secaucus 07094

Mercer County

Consumer Oil Co., 1473 Lamberton Road, Hamilton 08690

Middlesex County

Amoco, Roosevelt Avenue, Carteret 07008
Royal Petroleum Co., Cliff Road, Woodbridge 07095
Sun Oil Co., Stelton Road, Piscataway 08854

Monmouth County

Globe Petroleum Co., 9 Central Avenue, Red Bank 07701

Passaic County

Henoch Oil Co., 515 Broad Street, Clifton 07013

Salem County

Ross Fog Oil Co., 182 Handcocks Bridge, Salem 08079

Somerset County

Exxon Co., Routes 31 & 202, Raritan 08869

Union County

Buckeye Petrofuels, Marshes Dock Road, Linden 07036
Buckeye Pipeline, Lower Road to Rahway, Linden 07036
Croda Storage, Elizabeth 07207
Gulf Oil Co., Marshes Dock Road, Linden 07036
Northville Linden Terminal, Tremley Point Road, Linden 07036

Table 2-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW JERSEY INVENTORY OF MAJOR POINT SOURCES (CONCLUDED)

BULK GASOLINE TERMINALS (CONTINUED)

Warren County

Mobil Oil Terminal, N. Delaware Street, Greenwich Township 08886

in the emissions summary are listed in Table 2-2. This comparison was done for Bergen County only; criteria for selection of firms from the SID are explained in Section 1.3.1.2.2 and listed in Table 1-1.

The selection criteria were found to apply to 153 firms listed under Bergen County in the SID. Of these, 50 were found in the emission summary, while the remaining 103 are listed in Table 2-2. Of the 50 Bergen County firms which were found in both the SID and the emission summary, only nine were shown as having emissions greater than 100 tons per year of VOC or NO_x. Seven other major emitters were listed in the inventory, but not retrieved from the SID. Of these, at least two were bulk terminals and one was an electric generating facility, both types of facilities not routinely listed in the SID. The remaining four were presumably missed because of the employment criterion.

PES recommends that NJDEP undertake to contact a significant sample, such as 10 percent of the firms listed in Table 2-2, to determine whether any of them are indeed emitters of VOC or NO_x which should be added to the existing point source inventory. If the number of such firms found in Bergen County is appreciable, then the remaining counties in the state should be similarly studied.

2.3 REVIEW OF METHODOLOGIES FOR MINOR POINT SOURCES

Review of the documentation received from NJDEP reveals no system or plan for converting emissions from small industrial sources to area-source categories. The transmittal letter from NJDEP to EPA Region II indicates that major and minor point sources have been segregated at the cutoff point, 250 kg per day, recommended by EPA. Presumably NJDEP intends to deal with these small industrial sources as point sources, so that the segregation serves only to provide separate tabulations of major and minor sources.

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY

Name and Address	Employment
AEP Industries, Inc. 20 Knickerbocker Road, Moonachie, NJ 07074	175
Acme Air Appliance Co., Inc. 205 Newman Street, Hackensack, NJ 07601	106
Adelphi Industries 250 S. Commercial Avenue, Carlstadt, NJ 07072	100
Agfa-Gevaert, Inc. 275 North Street, Teterboro, NJ 07608	517
Alford Packaging Industrial Avenue, Ridgefield Park, NJ 07660	800
Aramis, Inc. 5 Thornton Road, Oakland, NJ 07436	220
Automated Extruding and Packaging, Inc. 20 Knickerbocker, Road, Moonachie, NJ 07074	175
Bergen Wire Rope Co. P.O. Box 1300, Lodi, NJ 07644	200
Burmah-Castrol, Inc. 401 Hackensack Avenue, Hackensack, NJ 07601	175
Bush Boake Allen, Inc. 7 Mercedes Drive, Montvale, NJ 07645	155
C & C Amershoe Int'l. Corp. 456 Nordhoff Place, Englewood, NJ 07631	100
C & C Metal Products Corp. 456 Nordhoff Place, Englewood, NJ 07631	100
Cantrell & Cochrane 397 E. 54th Street, Elmwood Park, NJ 07407	175
Carter, Ralph B. Co. 192 Atlantic Street, Hackensack, NJ 07602	120
Ceraglass 171 Newman Street, Hackensack, NJ 07601	200
Clarendon Press, Inc. 50 Broad Street, Carlstadt, NJ 07072	113
Coating Products, Inc. 580 Sylvan Avenue, Englewood Cliffs, NJ 07632	108
Coca-Cola Bottling Co. 411 Hackensack Avenue, Hackensack, NJ 07601	2,000
Colonial Printing Ink Co. 180 E. Union Avenue, East Rutherford, NJ 07073	100
Compucomp Corp. Maple Avenue, Fair Lawn, NJ 07030	180

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY (CONTINUED)

Name and Address	Employment
Compuscan, Inc. 900 Huyler Street, Teterboro, NJ 07608	301
Conoco Chemicals 80 Park Plaza East, Saddlebrook, NJ 07660	150
Cybermatics, Inc. 506 E. Palisade Avenue, Englewood, NJ 07631	400
Devonsheer Melba Corp. 99 Amor Avenue, Carlstadt, NJ 07072	215
ESC Electronics Corp. 534 Bergen Blvd., Palisades Park, NJ 07650	100
Einson Fremman & Detroy Corp. 20-10 Maple Avenue, Fair Lawn, NJ 07410	271
Electro-Scan, Inc. 45 Outwater Ln., Garfield, NJ 07026	26,412
Enterprise Corrugated Container Corp. 575 North Midland Avenue, Saddlebrook, NJ 07662	150
Federal Paper Board Co., Inc. (corp. hdqtrs.) 75 Chestnut Ridge Road, Montvale, NJ 07645	4,990
Flavor Tree Foods 200 Carol Place, Moonachie, NJ 07074	240
Flintkote Co. 40 Eisenhower Drive, Paramus, NJ 07652	180
GM Chemical & Container Corp. 5 Atwood Avenue, Tenafy, NJ 07670	100
General Manufacturing Corp. 20 Arnot Place, Lodi, NJ 07644	100
General Printing Ink Co. 390 Central Avenue, East Rutherford, NJ 07073	130
Hanson, Paul Co., Inc. 610 Commercial Avenue, Carlstadt, NJ 07072	120
Hardin Paper Co., Inc. 109 Lanza Avenue, Garfield, NJ 07026	120
Hunt, Philip A. Chemical Corp. Foot of Roosevelt Place, Palisades Park, NJ 07650	250
Insulfab Plastics, Inc. 150 Union Avenue, East Rutherford, NJ 07073	104
International Wire Products Co. 500 W. Main Street, Wyckoff, NJ 07481	250
KEM Manufacturing Co. Maple Avenue & River Road, Fair Lawn, NJ 07410	200

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY (CONTINUED)

Name and Address	Employment
Kimball Systems E. 64 Midland Avenue, Paramus, NJ 07652	1,000
Kreisler Industrial Corp. 180 Van Ripper Avenue, Elmwood Park, NJ 07407	100
Lander Co., Inc. 1530 Palisade Avenue, Fort Lee, NJ 07024	250
Lanman & Kemp-Barclay & Co., Inc. 25 Woodland Avenue, Westwood, NJ 07675	100
Leeds Dixon Laboratories, Inc. Moonachie Avenue, Moonachie, NJ 07074	200
Lehn & Fink Products Group 225 Summit Avenue, Montvale, NJ 07645	550
Leitz, E., Inc. Link Drive, Rockleigh Industrial Park, Rockleigh, NJ 07647	250
Lipton, Thomas J., Inc. 800 Sylvan Avenue, Englewood Cliffs, NJ 07632	925
Lonza, Inc. 22-10 Route 208, Fair Lawn, NJ 07410	100
Luft-Tangee, Inc. 400 Gotham Parkway, Carlstadt, NJ 07072	172
Marijon Dyeing and Finishing Co., Inc. 219 Murray Hill Parkway, East Rutherford, NJ 07073	123
Matheson Gas Products 1275 Valleybrook Avenue, Lyndhurst, NJ 07071	222
Meehan-Tooker, Inc. 55 Madison Circle Drive, East Rutherford, NJ 07073	300
Melnor Industries 1 Carol Place, Moonachie, NJ 07074	500
Metaframe Corp. 41 Slater Drive, Elmwood Park, NJ 07407	450
Metropolitan Glass & Plastic Containers, Inc. 1 Passaic Street, Wood-Ridge, NJ 07075	100
Monsanto Flavor Essence, Inc. 7 Mercedes Drive, Montvale, NJ 07645	137
Mosstype Corp. 150 Franklin Turnpike, Waldwick, NJ 07463	116
Myers, J & P.B., Inc. 65 Oxford Drive, Moonachie, NJ 07074	125
Myron Mfg. 121 E. Hunter Avenue, Maywood, NJ 07607	250

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY (CONTINUED)

Name and Address	Employment
National Laboratory 225 Summit Avenue, Montvale, NJ 07645	500
Okonite Co. Hilltop Road, Ramsey, NJ 07446	1,700
Ormont Drug & Chemical Co. 520 S. Dean Street, Englewood, NJ 07631	100
Owcus Illinois, Inc. 100 Redneck Avenue, Moonachie, NJ 07075	138
Packaging Corp. of America 70 Outwater Lane, Garfield, NJ 07026	121
Penick Corp. 1050 Wall St., W., Lyndhurst, NJ 07071	730
Pfizer, Inc. 199 Maywood Avenue, Maywood, NJ 07607	100
Pioneer Paper Corp. 50 Triangle Blvd., Carlstadt, NJ 07072	120
Plastimatic 380 Chestnut Street, Norwood, NJ 07648	150
Plessy-Montvale 20 Craig Road, Montvale, NJ 07645	100
Plus Mark, Inc. 631 Central Avenue, Carlstadt, NJ 07072	225
Poly Plastic Products, Inc. P.O. Box 157, Oakland, NJ 07436	125
Popper, J.S., Inc. 200 Liberty Street, Little Ferry, NJ 07643	125
Potters Industries, Inc. 377 Route 17, Hasbrouck Heights, NJ 07604	210
Power/Mate Corp. 514 S. River Street, Hackensack, NJ 07001	500
Powrmatic, Inc. 321 Commercial Avenue, Palisades Park, NJ 07650	100
President Container, Inc. 200 W. Commercial Avenue, Moonachie, NJ 07072	200
Presto Lock Co. 100 Outwater Lane, Garfield, NJ 07026	760
Progresso Foods 365 W. Passaic Street, Rochelle Park, NJ 07662	100
REL Manufacturing Corp. 475 Blvd., Elmwood Park, NJ 07407	104

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY (CONTINUED)

Name and Address	Employment
Reynolds and Reynolds Co. 109 Midland Avenue, Elmwood Park, NJ 07407	138
Ridgewood News, Inc. 30 Oak Street, Ridgewood, NJ 07451	264
Rilsan Corp. 139 Harristown Road, Glen Rock, NJ 07452	125
Rockeach, I. & Sons, Inc. 560 Sylvan Avenue, Englewood Cliffs, NJ 07632	112
Roure Bertrand Dupont, Inc. 1775 Windsor Road, Teaneck, NJ 07666	135
Rutherford Machinery Co. 401 Central Avenue, East Rutherford, NJ 07073	208
SGL Modern Creative 35 Market Street, Elmwood Park, NJ 07407	222
Schiff Biofood Products Co. Moonachie Avenue, Moonachie, NJ 07074	200
Sexton, John & Co. 360 S. Van Brunt St., Englewood, NJ 07631	180
St. Joe Paper Co. 89 Leuning Street, P.O. Box 1988, South Hackensack, NJ 07606	160
Standard Corrugated Case Corp. 686 Grand Avenue, Ridgefield, NJ 07657	100
Standard Tool & Mfg. Co. 738 Schuyler Avenue, Lyndhurst, NJ 07071	350
Star Manufacturing Inc. 101 Industrial Avenue, Little Ferry, NJ 07643	125
Star-Glo Industries 2 Carlton Avenue, East Rutherford, NJ 07026	250
Sun Chemical 222 S. Marginal Road, Fort Lee, NJ 07024	108
Tanatex Chemical Co. Page & Schuyler Avenues, Lyndhurst, NJ 07071	102
Termasol Ltd. Thermasol Plaza, Leonia, NJ 07605	200
Technical Reproductions Corp. 407 Sette Drive, Paramus, NJ 07652	100
Tension Envelope Corp. Huyler & Wesley Sts., South Hackensack, NJ 07606	267
United Wire Hanger Corp. 1-5 Plant Road, Hasbrouck Heights, NJ 07604	140

Table 2-2. CRITERIA FIRMS FROM BERGEN COUNTY NOT FOUND IN EMISSIONS SUMMARY (CONCLUDED)

Name and Address	Employment
Wella Corp. 524 Grand Avenue, Englewood, NJ 07631	360
West Shore Publishing, Inc. 19-01 Route 208, Bogota, NJ 07410	100
Witco Chemical Corp. Route 4 at Forest Ave., E 210, Paramus, NJ 07652	250

NJDEP intends to check the emission totals by SIC categories, developing employment-related emission factors using emissions data from the point source inventory and employment statistics from NJ Department of Labor. When these calculations have been done, it will be of interest to compare the results with the factors recommended in EPA-450/2-77-028.

NJDEP's documentation indicates that area source categories for graphic arts and dry cleaning have been defined so as to exclude emissions from industrial sources. This is consistent with EPA recommendations and with the APEDS approach to industrial source emissions, so long as the APEDS inventory is essentially complete for both major and minor industrial sources. However, the area source category for degreasing is intended to cover small industrial and commercial firms. This can lead to redundant incorporation of estimates in both the small industrial and area source inventories, unless degreasing emissions are excluded from one or the other of these inventories. Current documentation does not indicate that this problem has been resolved.

2.3.1 CONCLUSIONS AND RECOMMENDATIONS

1. NJDEP's documentation deals only very sketchily with the treatment of minor point sources in the emission inventory. It does, however, indicate that industrial sources, including minor point sources, are excluded from the area source estimates for graphic arts and dry cleaning, but not for degreasing.

2. Since this approach relies on the complete registration of minor industrial sources in the APEDS system, we recommend that the totals for such sources, listed by DEP as "Small Industrial Sources," be reviewed and, if necessary, scaled up to account for any incomplete coverage of minor industrial emitters which might be revealed by further study of potential sources named in the RACT

list or in the State Industrial Directory for New Jersey (cf. Table 5).

3. PES recommends that NJDEP restudy and resolve the problem of possible duplication of estimated emissions from industrial degreasing.

2.4 ENGINEERING REVIEW OF POINT-SOURCE EMISSION ESTIMATES

The original intention of PES was to review the detailed calculations supporting emissions estimates, as found in the point-source emissions inventories, for a significant sample of the major point sources in those inventories. Preliminary review, however, showed that the EIS file supplied by NJDEP did not consistently contain all information necessary to confirm the VOC and NO_x emissions estimates as presented there. PES therefore devised alternative strategems for judging the plausibility and self-consistency of the emissions estimates, where possible.

The NJDEP inventory was organized in EIS format and a printout was furnished to PES by Engineering-Science, Inc., with NJDEP's approval. On review, we found that the printout showed information only for points having estimated emissions of VOC or NO_x of 100 tons per year, or more; thus, points estimated to emit 99 tons per year or less were not included, even though they might belong to a major emitting facility. A separate listing gave, for each county, estimated total emissions of each pollutant from each facility (and from each point) in the inventory, but without the engineering data contained in the EIS listing. A third listing, even more condensed, gave VOC and NO_x emissions for points where they exceeded 100 tons per year, organized by SIC categories.

Major shortcomings of the information provided by the EIS printout were (1) processes contributing to the emissions for a given point source were not consistently numbered and characterized; (2) emission factors were not included in the file; (3) employment

was not indicated. In addition, such engineering data as maximum design rate, fuel heat content, and fuel use or processing rates were often, if not always, mis ng.

Computation of an emission estimate based on EIS data normally involves multiplying the processing rate (or fuel use rate) by an appropriate emission factor, and correcting for any abatement provided by control devices. If the processing rate and control efficiency are known and an estimated emissions rate has been given, it is possible to reverse the calculation and determine what emission factor must have been applied in order to obtain the estimated rate as given. Since, for similar processes, emission factors are expected to be of the same order of magnitude, PES decided to test for internal consistency in the emission file by calculating these implied emission factors, then comparing those relating to similar processes as indicated by the SCC (source classification code) applied to each process.

These calculations were performed for a sample of 12 percent of the 612 point source records found in the EIS listing. The sampling was performed by taking every tenth record in the list, or, if the data for the encountered record were insufficient, substituting the next listed record having necessary data. In addition, records were selected at random to ensure at least one record for each county and to include, deliberately, any very major emitters which would otherwise be missed. The results of these calculations are tabulated and discussed below.

2.4.1 IMPLIED EMISSION FACTORS FROM NEW JERSEY INVENTORY

Seventy-four point records were examined, from 612 in the printout. These included at least one for each county in New Jersey. Implied emission factors were calculated on the basis of

recorded throughput, control efficiency, and estimated emissions.* Each implied emission factor (i.e.f.) was then compared with the emission factor suggested by AP-42 (Appendix C) for use with the source classification code number given in the printout for the process indicated on the print record. I.e.f.'s were calculated both for HC and for NO_x, where corresponding estimates of emissions were found.

Results are shown in Table 2-3, organized by SCC category. Emission factors from AP-42 are shown in parentheses. In many instances, the implied emission factors are many times larger than the emission factors found in AP-42. Less often, the implied emission factors are very much smaller. In eight cases, one or both of the implied emission factors was greater than 10,000, and from 100 to 200,000 times as large as AP-42 factors, where these existed. (Four of these facilities have already been deleted from the emissions inventory, according to NJDEP's letter of April 1, 1981.)

There are very few cases of close agreement of the i.e.f.'s with AP-42 factors. The nearest is for point 12 of facility 0998 in county 1380 (Essex), where the AP-42 HC factor (for SCC 4-06-001-26) is 4.1, while the i.e.f. is 3.9. Agreement should be expected only for those cases in which the estimation method is designated by code 3, meaning that emission factors have been used to estimate these emissions.

Code 3 was in fact found on about one third of the estimates entered. The rest were mainly Code 4, with occasionally Code 1 or 5.

---

*$F = E/(Q \times (1-0.01C))$, where F = implied emission factor, Q is throughput (in SCC units), E is estimated emissions, C is control efficiency.

Aside from the expectation that the implied emission factors should resemble the relevant AP-42 factors, there is also an expectation that the i.e.f.'s should be nearly the same for various emission points characterized by one SCC number. That this is not uniformly true, one can see by examining the figures in Table 2-3 which pertain to 11 sources having SCC No. 1-02-004-02, where hydrocarbon i.e.f.'s range from 0 to 950, while NO_x i.e.f.'s range from 0.35 to 1,300,000.

As for reasons for the disagreements, the outstanding possibilities appear to be:

1. NJDEP may have used emission factors which differ from those given by AP-42.

2. Estimated emissions may have been incorrectly calculated, or entered in the wrong units.

3. Throughput may have been incorrectly entered; for example, it may have been expressed in units which were inconsistent with the units used in the emission factor.

4. Emissions may have been estimated by some method not involving emission factors based on throughput; for example, by factors based on employment.

In any event, since NJDEP has not documented its point source methodology, PES is unable to endorse the emission estimates found in the point source inventory.

2.5 REVIEW OF AREA-SOURCE METHODOLOGIES

PES reviewed the NJDEP documentation describing area-source methodologies, to determine whether all the standard area-source categories (shown in Table 1-2) were included. The New Jersey categories agreed with those in Table 1-2, with minor exceptions, as follows.

No figures were generated for the category, "Solvent Users - Surface coatings - Other small industrial." This omission is

Table 2-3. IMPLIED EMISSION FACTORS VS AP-42 EMISSION FACTORS
(100 TPY Sources from New Jersey EIS Printout)

SCC Category	County	Fac.	Pt.	Code	I.E.F., HC	I.E.F. NO_x
1-01-004-01 (HC 2.0, NO_x 105)	0660	0405	05	3	5.5×10^5	1.05×10^4
	3060	0814	03	3	1.7	46
	4900	0095	08	3	0.15	9
	5440	0702	06	4	1.5	40
1-01-005-01 (HC 2.0, NO_x 105)	5440	0702		3,4	1.5	58
1-02-004-01 (HC 3.0, NO_x 60)	1760	0222	06	3	1.5	40
	5020	0358	21	3	190	5,040
1-02-004-02 (HC 3.0, NO_x 60)	0300	1091	02	4	0.5	40
	0300	1096	13	4	1.4	40
	0740	0453	18	3	1.5	40
	0740	0719	03	3	1.6	40
	1050	0237	03	3	0.014	0.35
	1380	0918	01	4	0.5	64
	3060	0821	59	3	1.5	40
	3060	1336	04	3	0	1.3×10^6
	5440	0693	02	3	1.6	40
	5440	0698	03	3	-	13
	5660	0070	05	3	950	2.6×10^4
1-02-005-02 (HC 3.0, NO_x 60)	3900	0324	02	3	11	286
1-02-006-01 (HC, 3.0, NO_x 600)	1760	0218	85		3.3×10^{-3}	0.18
1-02-012-01	3180	0618	50	3	0.25	6.9
1-02-999-99	3060	0883	05	3	-	412
1-03-004-01 (HC 3.0, NO_x 60)	5660	0068	03	3	-	-

Table 2-3. IMPLIED EMISSION FACTORS VS AP-42 EMISSION FACTORS (CONTINUED)
(100 TPY Sources from New Jersey EIS Printout)

SCC Category	County	Fac.	Pt.	Code	I.E.F., HC	I.E.F. NO_x
1-03-004-02 (HC 3.0, NO_x 60)	3060	0967	01	4	1.0	53
1-05-001-04	3060	1336	03	3	0	1.3×10^6
2-01-001-01 (HC 5.6, NO_x 68)	1380 1380 2240 2260	0925 0925 0510 0195	09 19 06 01	3 3 3,4 4	11 21 7.8 -	149 253 69 0.3
2-01-005-01	0780	0070	05	3	2.7	34
3-01-009-03	0660	0437	04	4	1.0	-
3-01-014-01 (HC 30)	3060 3060	0825 1221	01 27	4 4	74 115	- -
3-01-018-99	0300	1553	04	4	3,670	140
3-01-999-99	3060 5440	1291 0742	18 40	4 4	190 1,470	- -
3-30-001-02	4120	0585	01	5	624	-
3-30-003-99	4120	0614	02	4	6,900	0.67
3-90-006-08	2240	0495	04	1	1.0	28
4-02-005-99 (HC 2,000)	0300	1091	35	4	1,080	-
4-02-006-99 (HC 2,000)	0300 0300	1091 1091	17 25	4 4	970 970	- -

Table 2-3. IMPLIED EMISSION FACTORS VS AP-42 EMISSION FACTORS (CONTINUED)
(100 TPY Sources from New Jersey EIS Printout)

SCC Category	County	Fac.	Pt.	Code	I.E.F., HC	I.E.F. NO_x
4-02-007-01 (HC 2,000)	1380	1562	05	5	337	-
4-02-008-01	3060	0906	08	1	169	-
4-03-001-01 (HC 80.3)	0080	0246	06	3	4,463	-
	2240	0859	03	4	1.3×10^5	-
	5300	0077	04	4	36	-
	5440	0765	07	4	1.3×10^5	-
4-03-001-03 (HC 9.0)	0780	0109	03	4	150	-
	1050	0281	08	4	0.3	-
	1760	0219	19	4	15	-
	2980	0702	01	4	3.2×10^5	-
4-03-001-07 (HC 13.1)	3260	0805	03	4	4,800	-
4-03-001-99	1760	0223	71	4	2.1	
4-03-001-01 (HC 12)	1380	0994	01	4	158	-
	1760	0218	43	4	35	-
	3060	0832	38	3	290	-
	3060	0942	02	4	5.9	-
4-03-002-02	5440	0689	65	5	50	-
4-03-002-03 (HC 10.6)	1760	0327	10	4	300	-
4-03-003-06 (HC 2.3)	5660	0075	30	5	4.4×10^5	-

Table 2-3. IMPLIED EMISSION FACTORS VS AP-42 EMISSION FACTORS (CONCLUDED)
(100 TPY Sources from New Jersey EIS Printout)

SCC Category	County	Fac.	Pt.	Code	I.E.F., HC	I.E.F. NO_x
4-04-001-99	1380	1039	33	4	9.7	-
	2260	0121	18	4	5,500	-
	3060	0815	42	4	3,300	-
	3060	0903	94	4	2.9×10^4	-
	3060	0925	66	4	7,700	-
	5440	0752	04	4	1,470	-
4-06-001-26 (HC 4.1)	1380	0998	12	4	3.9	-
5-03-005-06 (HC 1.0, NO_x 5.0)	4900	0160	76	4	6.3	1,000

acceptable if NJDEP believes that it has accounted for essentially all such emissions in its inventory of "Small Industrial Sources." EPA-450/2-77-028 advises, "Only if the agency is aware of numerous facilities emitting less than its point source cutoff level but does not have the resources to contact these small facilities should the point source totals be scaled up to account for the missing emissions."

The EPA category, "Field/slash/forest fire burning" has been abbreviated by NJDEP to "Forest fires." Any emissions from agricultural field burning or slash burning have presumably been omitted from the inventory. It is, of course, possible that such emissions are negligible in New Jersey.

2.6 REVIEW OF AREA-SOURCE FACTORS AND COMPUTATIONS

2.6.1 GASOLINE SERVICE STATIONS

a. Tank truck unloading (Stage I). PES concurs with the methodology described, but obtains estimates of VOC emissions which are about 4 percent less than those given in NJDEP's Table XVIII-5. By assuming annual activity spread over only 300 days per year instead of the 312 mentioned in the documentation, PES obtains results equivalent to NJDEP's.

b. Vehicle fueling (Stage II). PES concurs with the methodology described, but questions the assumption that activity occurs only on 6 days per week. PES estimates based on uniform year-round activity agree with those given in NJDEP's Table XVIII-6, suggesting that the NJDEP calculations were not based on the stated assumption, but on the assumption of seven days activity per week.

c. Storage tank breathing losses. PES does not concur with the stated assumption that breathing losses occur only 6 days a week. However, PES estimates based on seven days activity per

week do agree with the estimates given by NJDEP in their Table XVIII-7.

It appears to PES that, in each of these subcategories, the estimates are acceptable but the documentation should be slightly corrected.

2.6.2 DEGREASING (SMALL INDUSTRIAL/COMMERCIAL)

The methodology described in Section XI of NJDEP's documentation relies on the use of a per-capita emission factor (3.0 pounds per year). According to EPA-450/2-77-028, if such a factor is used, any cold-cleaning solvent use identified in the major point source inventory should be subtracted from the area sources total. The documentation does not indicate whether such sources exist, but if they do, it is clear that the county area-source totals have not been diminished to account for them.

An alternative approach is to delete all cold-cleaning emissons resulting from both major and minor industrial operations from the point source inventory.

The estimates given in NJDEP's Table XI-2 are correct and appropriate only for an inventory in which no cold-cleaning emissions are included in the point-source inventory.

2.6.3 DRY CLEANING

The methodology used is in accord with EPA recommendations, and PES confirms the estimates given by NJDEP in their Table XII-2.

2.6.4 ARCHITECTURAL SURFACE COATING

The methodology used is in accord with EPA recommendations and PES confirms the estimates given by NJDEP in Table XIII-4.

2.6.5 AUTO BODY REFINISHING

The methodology used is in accord with EPA recommendations and PES confirms the estimates given by NJDEP in Table XIII-3.

2.6.6 GRAPHIC ARTS

The methodology used is in accord with EPA recommendations and PES confirms the estimates given by NJDEP in Table XIV-2.

2.6.7 COMMERCIAL/CONSUMER SOLVENT USE

The methodology used is in accord with EPA recommendations and PES confirms the estimates given by NJDEP in Table XV-2.

2.6.8 CUTBACK ASPHALT

The methodology used is in accord with EPA recommendations. PES confirms the statewide total of the County estimates given by NJDEP in Table XVI-2. The individual county estimates, however, cannot be confirmed, because they are based on Department of Transportation data which are not presented.

2.6.9 PESTICIDES

The methodology used is in accord with EPA recommendations in regard to percent of active ingredients evaporating, photochemically reactive fraction and seasonal activity. The particular estimates given by NJDEP cannot be confirmed because they are based on data from the Department of Health, which are not presented.

2.6.10 STATIONARY SOURCE FOSSIL FUEL COMBUSTION

Estimation of emissions due to area source fuel use is documented by NJDEP in Section II of their report, giving rise to more than 50 tables, with no overall summary. The last 11 tables give seasonally adjusted emissions for different fuels and different

types of users. A review of those tables shows that the most important VOC emissions come from (1) commercial and institutional use of residual oil (Table II-49); (2) industrial use of residual oil (Table II-52); (3) industrial use of natural gas (Table II-53); (4) industrial use of distillate oil (Table II-51). However, the total of estimated hydrocarbon emissions, statewide, from all sources in this category, is less than 6,000 kg per typical summer day.

The methodology used in developing these estimates, for both VOC and NO_x, appears to be in close accord with EPA recommendations as set forth in EPA-450/2-77-028 and in AP-42. PES checked the use of emission factors, seasonal adjustment factors and VOC reactivity factors in detail and found very few apparently erroneous entries. In the case of commercial and institutional use of residual oil, it appeared that an adjustment corresponding to a correction for methane had been applied to the estimate of NO_x emissions instead of VOC, and a similar inversion occurred in connection with industrial use of residual oil.

Correction of these apparent mistakes would have the effect of increasing the total of the estimated NO_x emissions shown in Table II-49 from 7,750 kg per typical summer day to 8,600; and in Table II-52, from 13,800 to 15,300. VOC estimates would be slightly reduced, but the difference is negligible.

2.6.11 AIRCRAFT

The methodology used is consistent with EPA recommendations. Using the composite emission factors provided in the NJDEP documentation (Section III), PES confirmed the HC and NO_x emission estimates given in Tables III-2, III-5, and III-8, as well as the seasonally adjusted VOC and NO_x emissions tabulated in Tables III-11, III-12, and III-13. However, PES was unable to confirm the emission factors for HC and NO_x as given in Section III. Although

NJDEP states that these factors are derived from factors in AP-42 based on the mix of engine and aircraft types reported for New Jersey's aircraft operations, the resulting factors given for commercial aircraft are outside the range of factors cited in AP-42. For this reason, the computation of the factors cited by NJDEP should be reviewed.

2.6.12 RAILROAD LOCOMOTIVES

The methodology used is in accord with EPA recommendations, and PES confirms the estimates given by NJDEP in Table IV-5, based on the assumption that the distribution of railroad fuel use by county is correct as shown in Table IV-1.

2.6.13 VESSELS

The methodology used is, for the most part, in accord with EPA recommendations. The method of estimating port traffic for the separate districts involved is not prescribed by EPA but is plausible. Methodologies from EPA-450/2-77-028 were followed closely in estimating use of residual oil and distillate oil. Gasoline usage by small craft was estimated on the basis of annual fuel consumption rates cited by AP-42 and therefore conflicts with information in EPA-450/2-77-028, since the ratio of gasoline consumption rates (inboard/outboard) is four in the former reference, but only two in the latter.

Data given by NJDEP in Section V are insufficient to permit PES to verify the detailed calculations involved in producing the seasonally adjusted emissions estimates in Table V-5. However, the magnitudes of these estimates are plausible and the series of estimates for different counties appears reasonably self-consistent.

2.6.14 OFF-HIGHWAY VEHICLES

The methodology used by NJDEP for farm tractor emissions is slightly different from that recommended in EPA-450/2-77-028. It was taken from APTD 1135, a somewhat older document, and contains somewhat different estimates of fuel use per tractor, fuel consumption rates, and tractor mix (gasoline vs. diesel). It seems unlikely, however, that these differences would cause any serious errors in emissions estimates, since the differences between the sets of numbers in the two EPA documents are fairly small. Another difference between NJDEP's methodology and that suggested by EPA is in the use of harvested cropland as a surrogate for tractor distribution. The method is certainly plausible, especially if data on tractor distribution are unavailable.

Similarly, NJDEP applied methodology derived from APTD 1135 to estimating emissions from construction equipment and general utility engines, whereas EPA recommends a more detailed treatment, based on newer information.

Data given by NJDEP in Section VI are insufficient to permit PES to verify the detailed calculation involved in producing the seasonally adjusted emissions estimates in Tables VI-9 and VI-10. It should be noted that this category constitutes one of the more important area source categories for both VOC and NO_x emissions.

2.6.15 ONSITE INCINERATION

The methodology used is in accord with EPA recommendations. PES confirms the estimates given by NJDEP in Table VII-7.

2.6.16 OPEN BURNING

The methodology used is in accord with EPA recommendations and PES confirms the estimates given by NJDEP in Table VIII-3.

2.6.17 STRUCTURAL FIRES

The methodology used was derived from an EPA source (EPA 902/4-79-001). PES confirms the estimates of NO_x emissions given by NJDEP in Table IX-5. NJDEP asserts that no reactive VOC's are emitted by structural fires. This appears to be based on a misinterpretation of information in AP-42. PES suggests that reactive VOC fraction of the hydrocarbons be taken as equivalent to that for open burning.

2.6.18 FOREST FIRES

The methodology used is consistent with EPA recommendations. PES confirms the estimates given by NJDEP in Table X-2.

Field and slash burning are included in this category by EPA, but in "Open Burning" by NJDEP. No errors should be expected to result from this slight reorganization.

3.0 NEW YORK AUDIT

3.1 COMPARISON WITH RACT DIRECTORY

The plants named in Table 3-1 are listed in "Directory of Volatile Organic Compound Sources Covered by Reasonably Available Control Technology (RACT) Requirements," Volumes I, II and III (EPA-450/4-80-007 a,b,c, respectively) as existing in those counties of the State of New York which compose the New York City Metropolitan Area and are part of Air Quality Control Region 043, the New Jersey - New York - Connecticut Interstate Air Quality Control Region. They were, however, not found by PES in a computer listing of point sources of VOC emissions in those counties, provided by the New York State Department of Environmental Conservation, titled "Air Pollution Source Management System Emission Summary, sorted by SIC, unit type and name: Report Year 1980, Limit Type Actual, Application Type PCCO, Rune Date 01/12/81."

3.2 COMPARISON WITH STATE INDUSTRIAL DIRECTORY

In an attempt to ascertain whether the AIR-100 emission inventory provided substantially complete coverage of point sources which might be expected to emit hydrocarbons (VOC's) and oxides of nitrogen (NO_x), PES compared lists of facilities found in NYSDEC's emission summary (ES) with lists derived from the "1980 New York State Industrial Directory" (SID).* Firms found in the SID list but not in the emission summary are listed in Table 3-2. This comparison was done for Nassau County only; criteria for selection of firms from the SID are explained in Section 1.3.1.2.2 and listed in Table 1-1.

---

*Published by State Industrial Directories Corp., Wm. Penn Plaza, New York, NY 10001.

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES

GROUP I RACT CATEGORIES

CAN SURFACE COATING PLANTS

Kings County

American Can Co., 430 Kent Avenue, Brooklyn 11211
Le Comte & Co., 147 41st Street, Brooklyn 11232
Liberty Industries, 651 Lexington Avenue, Brooklyn 11221

Queens County

National Can Co., 4-40 44th Drive, Long Island City 11101
National Can Corp., 52-08 Grand Avenue, Maspeth 11378

FABRIC SURFACE COATING PLANTS

Kings County

Colorite Textile Print Works, 394 McGuinness, Brooklyn 11122
Glenmore Plastic Industries, 807 Banker, Brooklyn 11236
Murad Textile Print Works, 96 W Street, Brooklyn 11222
Plymouth Mills, 330 Thompsons, Brooklyn 10304
Roslyn Screen Print, Inc., 410 Morgan Avenue, Brooklyn 11211

New York County

Atlantic Textile Screen Printing, 591 Broadway, New York 10012
Princeton Textile Print, 530-542 W. 27th, New York 10001

Rockland County

Elk Piece Dye Works, Railroad Avenue, Garnerville 10923

Westchester County

Judscott Handprints, Ltd., 2269 Sawmill River Road, Elmsford 10523
Ruby Ray Textile Printing, 252 Lake Avenue, Yonkers 10701

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

LARGE APPLIANCE SURFACE COATING PLANTS

Kings County

Slattery, J.B. & Bros., Inc., 171 Wallabout, Brooklyn 11206

Queens County

ACME National Refrigeration, 19-26 Hazen Street, Long Island City 11101
Kam Water Heater Mfg. Co., 98-21 97th Avenue, Ozone Park 11416
King Refrigerator Corp., 76-02 Woodhaven Road, Glendale 11227

Westchester County

Springer Industries, Inc., 11 Brookdale Place, Mount Vernon 10550

METAL FURNITURE SURFACE COATING PLANTS

Bronx County

Art Steel Co., Inc., 1970 West 233rd Street, Bronx 10463

Kings County

Art Lloyd Metal Products Corp., 1101 Linwood Street, Brooklyn 11208
P.O.P. Displays, Inc., 11-12 30 Drive, Long Island City 11227
Supreme Equipment & System Corp., 170 53 rd Street, Brooklyn 11232
Vanguard Diversified, Vanguard Bus., 10 Java Street, Brooklyn 11222

New York County

Childcraft Center, 150 E. 58th Street, New York 10022

Queens County

Levin Fixture Corp., 40-70 Delong Street, Flushing 11354

Rockland County

Empire State Chair Co., Inc., Ft. Liberty, Haverstraw 10927

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

METAL FURNITURE SURFACE COATING PLANTS (CONTINUED)

Westchester County

Filex Steel Products Co., N. Water Street Ext., Ossining 10562

MAGNET WIRE SURFACE COATING PLANTS

Nassau County

Birnbach Co., Inc., 177G Hanse Avenue, Freeport 11520

Rockland County

Saxon Products, 215 N. Route 303, Congers 10920

PAPER PRODUCTS SURFACE COATING PLANTS

Kings County

Atlantic Gummed Paper Corp., 1 Main Street, Brooklyn 11201
Eaton Allen Corp., 67 Kent Avenue, Brooklyn 11211

Westchester County

Tuck Industries, Inc., Lefevre Lane, New Rochelle 10801

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

GROUP II RACT CATEGORIES

CHEMICAL SYNTHESIS PHARMACEUTICAL MANUFACTURING PLANTS

Bronx County

Hexagon Laboratories, Inc., 3536 Peartree Avenue, Bronx 10475
Polychemical Laboratories, Inc., 490 Hunts Point Avenue, Bronx 10474

Kings County

Pfizer, Inc., 235 E. 42nd Street, Brooklyn 10017

Nassau County

Accurate Chemical and Scientific Corp., 300 Shames Drive, Westbury 11590
Atomergic Chemetals Corp., 100 Fairchilds Avenue, Plainview 11803

Queens County

Aceto Chemical Co., Inc., 126-02 Northern Boulevard, Flushing 11368
American Lecithin Co., 32-34 61st Street, Woodside 11377
Arenol Chemical Corp., 40-33 23rd Street, Long Island City 11101

Rockland County

American Cyanamid, Middletown Road, Pearl River 10965
Ciba Geigy Corp., Old Mill Road, Suffern 10901

FLATWOOD PANELING SURFACE COATING PLANTS

Bronx County

U.S. Veneer Co., Inc., 888 Longfellow Avenue, Bronx 10474

INDUSTRIAL PERCHLOROETHYLENE DYRCLEANERS

Kings County

New York Cleaners Industry, 380 Flushing Avenue, Brooklyn 11205
Denihan, B.J., Inc., 505 E. 75th Street, New York 10021

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

INDUSTRIAL PERCHLOROETHYLENE DRYCLEANERS (CONTINUED)

Suffolk County

Link, Robert E., Drycleaning, 214 Emerson, Port Jefferson Station 11776

Westchester County

Belle Laundry & Cleaners, Inc., 40 Purchase, Rye 10580

PACKAGING ROTOGRAVURE AND FLEXOGRAPHIC PRINTING COMPANIES

Kings County

Action Packaging Corp., 667 Atkins Avenue, Brooklyn 11208
Metropolitan Label Co., 120 Knickerbocker Avenue, Brooklyn 11237
Sentinel Bag and Paper Co., Inc., 219 36th Street, Brooklyn 11232

Nassau County

Cameo Die and Label Co., Inc., Subsidiary of Follcraft Printing Corp., 1 Elm Street, P.O. Box 524, Locust Valley 11560
Haran Pkg. Co., Inc., 16 McCarthy Road, Island Park 11558

New York County

Art View Packaging, Lucky Polyethylene Mfg. Co., 251 Lee Avenue, New York 11206

Queens County

Applebaum Tag and Label Corp., 30-30 Northern Boulevard, Long Island City 11101

Suffolk County

Pres-Tige Label Corp., 255 Oser Avenue, Hauppage 11787

Westchester County

Excelsior Transparent Bag Mfg. Co., 159 Alexander Street, Yonkers 10701
Midtown Mfg. Corp., Albany Post Road, Montrose 10548

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONTINUED)

GROUP III RACT CATEGORIES

FABRIC PRINTING PLANTS

Kings County

Colorite Textile Print Works, 394 McGinness Boulevard, Brooklyn 11222

New York County

Princeton Textile Print, 542 W. 27th Street, New York 10001
Textile Prints Corp., 302 5th Avenue, New York 10001

Westchester County

Ruby Ray Textile Printing, 252 Lake Avenue, Yonkers 10701

SYNTHETIC ORGANIC CHEMICAL MANUFACTURING PLANTS

Bronx County

Adhesive Products Corp, 1660 Boone Avenue, Bronx 10460

Kings County

Felton International Inc., 599 Johnson Avenue, Brooklyn 11237
Harstan Chemical Corp., 1247 38th Street, Brooklyn 11218
Sapolin Paints, Inc., 183 Lorraine Street, Brooklyn 11231

Queens County

Grestco Dyes & Chemicals, Long Island City 11101
Smith Chemical and Color Co., 104-20 Dunkirk Street, Jamaica 11412

Richmond County

Procter & Gamble Co., Port Ivory 10301

Suffolk County

Mackenzie Chemical Works, Inc., 1 Cordello Avenue, Central Islip 11722
Northeastern Laboratories Co., 1875 Walt Whitman Road, S., Melville 11746

Table 3-1. PLANTS NAMED IN RACT DIRECTORY BUT NOT IN NEW YORK INVENTORY OF MAJOR POINT SOURCES (CONCLUDED)

BULK GASOLINE TERMINALS

Kings County

Shell Oil Co., 25 Paidge Avenue, Brooklyn 11222
Texaco, Inc., 1 N. 12th Street, Brooklyn 11211*
Texaco, Inc., 1776 Shore Parkway, Brooklyn 11214*

Nassau County

B.P. Oil Corp., 266 E. Shore Road, Great Neck 11023
Gulf Oil Co., Industrial Road, Hempstead 11551
Harbor Fuel Co., Inc., W. Shore Road, Oyster Bay 11771
Mobile Oil Co., Shore Road, Glenwood Landing 11547

Queens County

Power Test Petroleum Co., Railroad Avenue, Long Island City 11107
Sun Oil of Pennsylvania, 53-02 11th Street, Long Island City 11101

Richmond County

Mobil Oil Co., Ellis Lane, Staten Island 10307

Suffolk County

Exxon Chemical Americas, 146 Beach Street, Port Jefferson 11776
Mobil Oil Co., Bay Street, Sag Harbor 11963

Westchester County

Cities Service Oil Co., 8-20 Canal Street, Mt. Vernon 14075
Exxon Chemical Americas, Peekskill Terminal 10566
Gulf Oil Co., Ludlow Street, Yonkers 10702
Sun Oil Co. of Pennsylvania, Pelham Manor 10803

*One plant in Emission Summary, location ambiguous.

Table 3-2. CRITERIA FIRMS FROM NASSAU COUNTY NOT FOUND IN AIR-100

Name and Address	Employment
Abilities, Inc. Albertson, NY 11507	350
American Bank Stationery Co. 78 Midland Avenue, Hicksville, NY 11801	100
Arnel-Plastron 3601 Hempstead Turnpike, Levittown, NY 11756	500
Baby World Co., Inc. Station Plaza E., Great Neck, NY 11021	250
Barth Vitamin Corp. 270 W. Merrick Road, Valley Stream, NY 11580	120
Beacon Photo Service 482 Sunrise Highway, Rockville Center, NY 11570	500
Brooke Bond Foods, Inc. 2 Nevada Drive, Lake Success, NY 11040	253
Cameo Die and Label Co. (see also Foilcraft) 1 Elm Street, Locust Valley, NY 11560	120
Chemco Photo Products Charles Street, Glen Cove, NY 11542	900
Columbia Corrugated Container Corp. (see Great American), 300 Michael Drive, Syosset, NY 11791	200
Cutting Room Appliances Corp. 201 W. John Street, Hicksville, NY 11801	175
Darmex Industr. Corp. 71 Jane Street, Roslyn, NY 11577	123
Designatronics 55 S. Denton Ave., New Hyde Park, NY 11040	150
Dyna-Empire, Inc. 1075 Stewart Ave., Garden City, NY 11530	175
Ehlers Coffee 2 Nevada Drive, Lake Success, NY 11042	100
Electro Audio Dynamics 98 Cutter Mill Road, Great Neck, NY 11021	1,665
Foilcraft/Cameo Packg. (see also Cameo) 1 Elm Street, Locust Valley, NY 11560	120
Fougera, E. & Co. Cantiague Road, Hicksville, NY 11802	109
Four Star Associates, Inc. 260 Duffy Avenue, Hicksville, NY 11802	100

Table 3-2. CRITERIA FIRMS FROM NASSAU COUNTY
NOT FOUND IN AIR-100 (CONTINUED)

Name and Address	Employment
Foxall Mfg. Co. 15 Ivy Way, Port Washington, NY 11050	296
Frequency Electronics, Inc. 3 Delaware Drive, New Hyde Park, NY 11040	220
Georgian Web Offset E. Gate Blvd., Roosevelt Fld., Garden City, NY 11530	250
Graham Mfg. Co., Inc. 170 Great Neck Road, Great Neck, NY 11021	400
Great American Corrug. Cont. Corp. (see Columbia) 300 Michael Drive, Syosset, NY 11791	250
Greer Hydraulics, Inc. N. Plaza Bldg., Valley Stream, NY 11580	209
Grumman Crop. 1111 Stewart, Bethpage, NY 11714	2,000
H-G Toys, Inc. 750 Park Place, Long Beach, NY 11561	150
Helena Rubenstein Northern Blvd., East Hills, NY 11576	500
Hooker Chemicals & Plastics Corp. New South Road, Hicksville, NY 11802	126
Hybrid Co. 600 W. John Street, Hicksville, NY 11802	160
Hyde Park Chem. Corp. 170 Dupont Street, Plainview, NY 11803	146
Itcm Corp. 115 Cutter Mill Road, Great Neck, NY 11021	140
Jakobson Shipyard, Inc. West End Ave., Oyster Bay, NY 11771	107
Julius Wile Sons & Co. 3003 New Hyde Park Road, New Hyde Park, NY 11040	120
Kasco-Erco Labs. Cantiague Rock Road, Hicksville, NY 11802	145
Kordet Color Corp. 15 Neil Court, Oceanside, NY 11572	125
Lafayette Radio Electronics Corp. 111 Jericho Turnpike, Syosset, NY 11791	1,200
Limco Mfg. Corp. Garvies Pt. Road, Glen Cove, NY 11542	120

Table 3-2. CRITERIA FIRMS FROM NASSAU COUNTY
NOT FOUND IN AIR-100 (CONTINUED)

Name and Address	Employment
Lincoln Processing Co. 89 Frost Street, Westbury, NY 11590	100
Long Island Lighting Co. 250 Old Country Road, Mineola, NY 11501	5,482
MCP Facilities Corp. 25 Glen Head Road, Glen Head, NY 11545	116
Miracle Adhesives Corp. 250 Pittit Ave., Bellmore, NY 11710	100
Moonshine Products, Inc. 88 Hazel Street, Glen Cove, NY 11542	130
Musical Instr. Corp. of America 170 Eileen Way, Syosset, NY 11791	120
Office Products News 645 Stewart Avenue, Garden City, NY 11530	125
Osrow Products Corp. 303 Winding Road, Old Beth Page, NY 11804	200
P & F Industries, Inc. 98 Cutter Mill Road, Great Neck, NY 11021	500
P.A. Industries, Inc. 60 Inip Drive, Inwood, NY 11696	330
Penthouse Mfg. Co., Inc. 225 Buffalo Avenue, Freeport, NY 11520	100
Pickering & Co., Inc. 101 Sunnyside Blvd., Plainview, NY 11803	355
Plessy Connector Div. 100 Commercial Street, Plainview, NY 11803	480
Polarad Electronics, Inc. 5 Delaware Drive, Lake Success, NY 11040	128
Port Clyde Foods, Inc. 81 N. Broadway, Hicksville, NY 11802	650
Precision Disc Grinding Corp. 255 E. 2nd Street, Mineola, NY 11501	200
Reg-Amp, Inc. 5 Nassau Street, Rockville Center, NY 11571	100
Rodale Electronics, Inc. 603 Chestnut Street, Garden City, NY 11530	270
Rumford Nat'l. Grapics 71 S. Central Avenue, Valley Stream, NY 11580	1,000

Table 3-2. CRITERIA FIRMS FROM NASSAU COUNTY
NOT FOUND IN AIR-100 (CONTINUED)

Name and Address	Employment
Shell Packaging Corp., The 342 Great Neck Road, Great Neck, NY 11021	327
Shore Plastics, Inc. 146 Hanse Avenue, Freeport, NY 11520	105
Southland Frozen Foods, Inc. 1 Linden Plaza, Great Neck, NY 11021	300
Spellman High Voltage Electronics Corp. 215 Park Avenue, Hicksville, NY 11801	135
Sterling Instrument 55 S. Denton Avenue, New Hyde Park, NY 11040	175
Studley Paper Co., Inc. 95 Inip. Drive, Inwood, NY 11696	510
Stur-dee Health Products 2 Austin Blvd., Island Park, NY 11558	165
Tekwave, Inc. 3 Delaware Drive, New Hyde Park, NY 11040	200
Terrace Lithographers 182 Sweet Hollow Road, Old Bethpage, NY 11804	100
Three-Dimensional Circuits 111 E. Aures Court, Plainview, NY 11803	100
Tri-Wall Containers 7600 Jericho Turnpike, Woodburg, NY 11797	116
Trio Laboratories 80 Dupont Road, Plainview, NY 11803	150
UPA Technology, Inc. 60 Oak Drive, Syosset, NY 11791	125
United Technical Publications, Inc. 645 Stewart Avenue, Garden City, NY 11530	140
United Utensils Co., Inc. Yennicoch Avenue, Port Washington, NY 11050	100
Vanguard Industries 1 Old Country Road, Carle Place, NY 11514	6,336
Vernitron Corp. 185 Community Dr., Great Neck, NY 11022	2,700
Vicon Industries, inc. 125 E. Bethpage Road, Plainview, NY 11803	300
Wallmates Vinyl, Inc. Bellmore, NY 11710	110

Table 3-2. CRITERIA FIRMS FROM NASSAU COUNTY
NOT FOUND IN AIR-100 (CONCLUDED)

Name and Address	Employment
Weba, Inc. 1301 4th Avenue, New Hyde Park, NY 11040	160
Ziegler Chemical & Mineral Corp. 170 Great Neck Road, Great Neck, NY 11021	110

For Nassau County, the SID yielded 112 firms, of which 34 (30 percent) were found in the AIR-100 summary and 78 were not. Of the 34 Nassau County firms which met the employment and SIC criteria for retrieval from the SID and which were identified in the AIR-100 inventory, only five (14 percent) were shown as having emissions greater than 100 tons per year of HC or NO_x. Of the four major emitters in Nassau County identified in the inventory but not retrieved in the search, two were in the SID but below the employment search cutoff of 100, while the other two were bulk gasoline terminals (not manufacturing facilities) and therefore did not appear in the SID. If, hypothetically (although this is very improbable), all of the 78 firms from the search which were not in the inventory had the same distribution of emissions as the 34 which were in the inventory, then 11 of the 78 should be major emitters.

Actually, of course, it is not certain that any of the 78 search-retrieved firms emits VOC or NO_x in any quantity. However, they do compose a logical set of candidate firms which should be reviewed to determine, from more specific information, whether any of them in fact belong in the AIR-100 inventory for Nassau County.

PES recommends that NYSDEC undertake to contact a significant sample, such as 10 percent of the firms listed in Table 3-2, to determine whether any of them are indeed emitters of VOC or NO_x which should be added to the existing point source inventory. If the number of such firms found in Nassau County is appreciable, then the remaining counties in the state should be similarly studied.

3.3 REVIEW OF METHODOLOGIES FOR MINOR POINT SOURCES

There is inevitably an element of arbitrary choice associated with the distinction between point sources and area sources, since the latter are defined as those sources which are too small to be usefully identified and tracked on an individual basis. For regional oxidant modeling, it is generally assumed that only sources

emitting more than 250 kg per day, of VOC or NO_x, need be retained in the inventory as point sources, and that smaller sources may be aggregated into area source categories.

NYSDEC has accepted the suggested cutoff level of 250 kg per day for oxidant modeling purposes. However, the AIR-100 system is based on information obtained from a permit system which yields estimates of emissions from individual point sources, even for many facilities whose emissions are far less than 250 kg per day (or, on a continuous basis, 100 tons per year). Thus, the indicated procedure for New York sources is to subdivide the AIR-100 inventory into two parts, one a point-source list containing all those facilities having VOC or NO_x emissions exceeding 100 tons per year, the other a collection of area-source categories aggregating the remaining smaller facilities.

Documentation from NYSDEC suggests that this procedure has been followed in relation to industrial processes and industrial surface coating operations in the outer counties, but not in New York City. Because of reservations about the completeness and accuracy of the data on New York City sources, emissions for the five counties within the city were estimated from statistics on employment (provided by the New York State Department of Labor), with the aid of employment-related emission factors given in EPA-450/2-77-028.*

PES notes that the procedures cited in NYSDEC's narrative documentation do not unambiguously prescribe methods of estimating the relevant area source emissions, either for New York City or for the outer counties.

---

*Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds, Volume I (Second Edition, September 1980).

In regard to emissions from the boroughs, the documentation includes no information which might be used to substantiate the estimates which have been provided. In order to provide an unambiguous check for any of the source categories included in the NYSDEC Summary Tables, it would be necessary to know: (1) what SIC categories are included in each Summary Table category; (2) what emission factor goes with each SIC category; and (3) what employment was associated with each category.

- The relation of Summary Table categories to SIC categories in many cases is far from obvious. Although petroleum refineries may unambiguously be assigned to SIC 2911, what SIC numbers are needed for surface coating of fabrics? Such questions continuously confront the analyst assigned to performing these estimates; the documentation provides no evidence that a standard, or even a consistent, system was used.

- Employment-related emission factors are given in EPA-450/2-77-028 for 54 SIC categories, and NYSDEC has added two more, from unspecified sources. Unfortunately, this is a very incomplete list of SIC categories, and it omits many which are potential VOC area sources. For example, NYSDEC gives an estimate of emissions from Synthetic Fiber Manufacture in New York County, 813 kg per day. But the appropriate SIC category may be 2824 ("synthetic organic fibers, except cellulosic"), for which there is no employment-related emission factor in the list. Complete documentation of the methodology requires an explanation of what assumptions were made or what other procedures were used to arrive at estimates for these ambiguous cases.

- A printout of the NYSDOL statistics on employment by four-digit SIC code would facilitate verification of these area-source emissions estimates.

The Summary Tables do include certain point-source emissions estimates for the boroughs, even though the documentation implies that point-source information for the boroughs was not to be used. In the case of graphic arts, point-source emissions are cited for New York and Queens.

If graphic arts VOC emissions are estimated for the boroughs on the basis of population and the per capita emission factor, 0.8 pounds per capita per year (recommended by EPA-450/2-77-028), the estimates shown in Table 3-3 are obtained. Table 3-3 also shows the estimated emissions as given by NYSDEC, for point and area sources, in the Summary Tables. It is evident that the area-source figures given by NYSDEC have been obtained by subtracting the point-source estimates, whatever their origin, from the population-based totals. The result, unfortunately, is not in accord with EPA recommendations for methodology in this category. The reference cited above says (p. 4-21), "An emission factor of 0.8 lb/capita/year is recommended for...small graphic arts facilities which emit less than 100 tons per year. Graphic arts facilities which emit more than 100 tons of VOC per year are excluded from this factor..."

This implies that the figures which appear in Table 3-3 as NYSDEC estimates for area sources should be replaced by those now shown in the "Total" column, and the point-source emissions should be added to, rather than subtracted from, these area-source estimates.

In regard to emissions from the outer counties, the fact that categories in the Summary Table have not been defined in terms of constituent SIC categories hampers direct confirmation of the estimates of point-source and area-source emissions. However, there is no obvious reason to suppose that NYSDEC's results are incorrect. In one case which has a rather straightforward interpretation, namely, pharmaceuticals manufacturing in Rockland County, point and area sources are listed as, respectively, 3338 and 160 kg per day. These values agree with the totals obtained from the

Table 3-3. ESTIMATED VOC EMISSIONS FROM GRAPHIC ARTS FOR THE COUNTIES OF NEW YORK CITY, BASED ON POPULATION AND PER CAPITA FACTORS, COMPARED WITH NYSDEC POINT AND AREA SOURCE ESTIMATES (kg per typical summer day)

County	NYSDEC Estimates Point	Area	Total	PES Estimates Area
New York	1,354	345	1,699	1,700
Kings	0	2,866	2,866	2,866
Queens	1,737	559	2,296	2,294
Bronx	0	1,566	1,566	1,565
Richmond	0	431	431	430

AIR-100 Emission Summary for SIC number 2834, taking the assumption that the two facilities found in this SIC category operate uniformly, 6 days per week, around the year. There are eight other cases, among the four outer counties, in which Summary Table categories show emissions from both point and area sources. Table 3-4 shows the categories and the emissions involved.

3.3.1 CONCLUSIONS AND RECOMMENDATIONS

1. Documentation of the procedures used to estimate area-source emissions corresponding to minor point sources, mainly in industrial categories, is inadequate to support data quality review. We recommend that NYSDEC define the area-source categories used in compiling the county inventory summaries in terms of the SIC categories contributing to each, and that they specify the employment-related emission factor used for each SIC category.

Table 3-4. VOC EMISSIONS ESTIMATED BY NYSDEC (SUMMARY TABLES) FOR CATEGORIES WITH EMISSIONS FROM BOTH POINT AND AREA SOURCES, IN THE OUTER COUNTIES.
(kg per typical summer weekday)

County	Category	Emissions	
		Point	Area
Nassau	Industrial Processes: Others	435	1,043
Nassau	Plastic Parts Painting	404	67
Nassau	Large Aircraft (Surface Coating)	1,970	15
Nassau	Industrial Surface Coating: Others	1,185	372
Suffolk	Large Aircraft (Surface Coating)	393	79
Suffolk	Industrial Surface Coating: Others	338	93
Suffolk	Open Burning	803	37
Rockland	Pharmaceutical Manufacture	3,338	160
Westchester	Plastic Products Manufacture	431	300

PES also recommends that a printout of the NYSDOL statistics on employment for SIC categories be furnished, to be used in verifying emissions estimates given in the county summaries.

2. Emissions for major point sources in the graphic arts category, as discussed above, should be excluded from the area-source emissions calculated on the per capita basis. This will have the effect of increasing the estimated total VOC emissions in New York and Queens counties by the point-source values shown in Table 3-4.

3.4 ENGINEERING REVIEW OF POINT-SOURCE EMISSION ESTIMATES

The AIR-100 emissions inventory yielded, for PES review, two principal printouts:

1. "Emission Summaries" (ES) for each county in the New York Metropolitan Area, showing estimated potential, actual, and

allowable emissions of each pollutant from each point source in the inventory, with totals for each SIC category within the county, and with totals for the county.

2. A "Facility Data List" (FDL) showing engineering data, process information, and estimated emissions for all point sources within facilities which emit 100 tons per year, or more, of VOC. (Not all major NO_x emitters are included).

The principal shortcoming of these files, in relation to the task of reviewing emissions estimates, was an almost complete lack of information about actual plant throughputs (process rates), which are essential to estimating emissions as well as to calculating implied emission factors. Because of this problem, PES was unable to verify any of the AIR-100 emission estimates. We did, however, undertake some assessment of internal consistency in relation to the available engineering data, as indicated below.

As a first step in reviewing the quality of emissions estimates for this file, we compared the emissions indicated in the Facility Datalist (FDL), point by point, with those indicated in the Emissions Summary (ES); however, processes having negligible emissions were omitted from the comparisons. Thus, we compared the two lists for 34 facilities and 256 points. Out of these, we found significant or possibly significant discrepancies or ambiguities for 14 facilities and 39 points, as listed in Table 3-5.

Since the FDL contains information on the chemical identity of emissions, we checked for occurrence of nonreactive VOC's at the facilities reviewed. Totals listed were: methane, about 4,900 tpy, mainly from one facility in Suffolk County; dichloromethane, 410 tpy, from one facility in Rockland County; and trichloroethane, 210 tpy, from several facilities in Nassau, Rockland, and Westchester counties. The information in the Emission Summary does not distinguish between reactive and nonreactive hydrocarbons.

Table 3-5. DISCREPANCIES IN EMISSIONS IN AIR-100 PRINTOUTS
(100 TPY HC Facilities from Facility Datalist
vs. Emission Summary)

County	Facility	Point	Type of Problem and Emissions Affected
Nassau	3694	10	ES gives HC 1,434 tpy, FDL only 717
	1410	12	ES gives HC 13 tpy, FDL no listing
	1160	30902	ES gives HC 7.6 tpy, FDL no listing
	3100	50	FDL gives HC 4.3 tpy; ES indicates 4.3 allowable, 0 actual
Suffolk	1922	01	ES gives HC 74.5 tpy, FDL no listing; ES gives NO_x 7,800 tpy, FDL only 3,800
		03	ES gives HC 87 tpy, FDL no listing; ES gives NO_x 9,100 tpy, FDL only 3,800
Kings	GT01	455	FDL gives HC 349 tpy, ES only 168
	GT03	BKL10	FDL gives HC 237 tpy, ES only 127
Queens	CE01	01	ES gives NO_x 2,152 tpy, FDL only 1,138
		02	ES gives NO_x 2,152 tpy, FDL only 1,138
		31-32	ES gives NO_x 2,914 tpy, FDL only 1,980
		41-42	ES gives NO_x 5,234 tpy, FDL only 1,800
		51-52	ES gives NO_x 5,234 tpy, FDL only 1,800
	(total CE01,		ES gives NO_x 17,700 tpy, FDL only 7,900 ES gives HC 168 tpy, FDL none)
	CE03	01	ES gives NO_x 7,790 tpy, FDL only 2,720
		02	ES gives NO_x 6,410 tpy, FDL only 2,720
		03	ES gives NO_x 14,100 tpy, FDL only 6,490
	(total CE03,		ES gives NO_x 28,300 tpy, FDL only 11,900 ES gives HC 270 tpy, FDL none)
Richmond	GT01	13	FDL shows HC 19 tpy; ES none
		OOVRU	FDL shows HC 12 tpy; ES none
	GT02	04	ES gives HC 37 tpy, FDL no listing
Rockland	0095	12020	FDL confidential; ES lists HC 10 tpy
		12049	FDL confidential; ES lists HC 315 tpy
		12051	FDL gives HC 47 tpy, ES lists half as much
		12055	FDL gives HC 8 tpy, ES lists half as much
		15009	FDL gives HC 7 tpy, ES lists half as much

Table 3-5. DISCREPANCIES IN EMISSIONS IN AIR-100 PRINTOUTS (CONCLUDED)
(100 TPY HC Facilities from Facility Datalist vs. Emission Summary)

County	Facility	Point	Type of Problem and Emissions Affected
Rockland (cont'd)	0088	15045	FDL confidential; ES lists HC 19 tpy
		15052	FDL gives HC 13 tpy, ES lists only 8.7
		15058	FDL gives HC 59 tpy, ES gives 0.005
		21211	FDL gives HC 26 tpy, ES gives 17.7
		21212	FDL gives HC 26 tpy, ES gives 17.7
		21213	FDL gives HC 26 tpy, ES gives 17.7
		21237	ES gives HC 32 tpy, FDL no listing
		00B06	FDL gives HC 5.4 tpy, ES no listing
		00C01	FDL gives HC 38 tpy, ES no listing
		00C02	FDL gives HC 21 tpy, ES half as much
		00C03	FDL gives HC 13 tpy, ES half as much
		00C04	FDL gives HC 117 tpy, ES no listing
		00C06	FDL gives HC 117 tpy, ES half as much
		00C07	FDL gives HC 234 tpy, ES half as much
		00E20	FDL gives HC 7 tpy, ES no listing
		0V104	FDL gives HC 11 tpy, ES no listing
	(total 0088, FDL gives HC 616 tpy, ES only 252)		
Westchester	0098	01	FDL and ES give HC 4,300 tpy; too high
	0979	06	Ozone listed an emission on FDL
		07	Inorganics listed for HC
		10	FDL confidential; ES lists HC 60 tpy

Although the Facility Datalist does not, in general, provide information about process operating rates, it does contain some engineering information which can, in certain cases, be scrutinized for self-consistency. PES studied the engineering data for several facilities with rather large emissions, to explore whether such records seemed consistent with engineering expectations. The following paragraphs describe these tests and findings.

(1) Concentrations of VOC's in Stack Gases.

When the rate of flow of stack gas is indicated, the concentration of pollutants in the stack gas can be inferred if the pollutant emission rate is known. PES performed this calculation for a few processes in two facilities for which the necessary information was at hand. Results are shown in the following table.

County	Facility	Point	VOC	ACFM[1]	PPH[2]	PPMV[3]
Nassau	2128	20	"Acetates"	140	.54	332
		29	TCE[4]	3,000	29.5	475
	3694	6	MEK[5]	7,500	125	1,460
			Acetone	7,500	31.8	447
			Toluene	7,500	14.6	134
		7	Toluene	13,300	27.1	150

Notes:
[1]ACFM: actual cubic feet per minute
[2]PPH: pounds per hour
[3]PPMV: parts per million (by volume)
[4]TCE: trichloroethane
[5]MEK: methyl ethyl ketone.

The implied concentrations (PPMV) are all within a reasonably expectable range for good engineering practice.

(2) Bulk Gasoline Terminals (Nassau County)

The FDL indicates that, at facility 3260, about 1,000 tpy of HC is emitted through a stack 4 inches in diameter. This seems a rather large emissions estimate for such a stack. PES calculates that, at the listed exhaust flow rate of about 300 cfm., the average linear velocity through the stack would be about 40 feet per second, or 30 miles per hour. Also, the concentration of gasoline vapor in the gas leaving the stack would be about 8 volume percent. At the same time, the emission rate potential (ERP) is given as 2,460 pounds per year, with actual emissions of 246 pounds per year. This implies emissions control of 90 percent, yet the printout shows no explanation for this control. We estimate that the ERP of 2,460 implies an average rate of truck loading, without controls, of about 30 trucks an hour, around the year. We suspect that these parameters are uncommon, and recommend a review of the calculations which generated the AIR-100 input data for this facility.

For facility 3270, there are discrepancies between the emissions estimates as given in pounds per hour and in pounds per year. Thus, at point 1, HC emissions are said to be 3.4 pounds per hour, but 1,190 pounds per year. However, for continuous operation, 3.4 pounds per hour would yield nearly 30,000 pounds (15 tons) per year. Similar discrepancies appear for points 2 and 4, but not for point 3. Point 5, on the other hand, is said to have an ERP of 864 pounds per hour, which seems too high. We estimate that, if 300,000 gallons of gasoline are loaded (into about 35 trucks) in a day of 15 hours operation, with no controls, the emission rate potential should be only about 150 pounds per hour, or 350 tons per year. Again, for point 5, the ratio of "actual" emissions to ERP implies 90 percent control, but this control is not specified in the printout.

(3) Power plants: NO_x Emissions

For facility 1922 in Suffolk County, stack parameters given for points 1 and 2 permit the calculation of stack gas volume flow, which works out to 724,000 SCFM in each case. The FDL shows, for point 1, 727,000 SCFM, which is good agreement; but for point 2, the FDL gives only 35,000 SCFM, which appears to be an error. Fuel use is the same for both points (23,500 gallons per hour, residual oil) and the recorded heat input ($3,435 \times 10^6$ Btu per hour) is reasonable. NO_x emissions (reported as 869 pounds per hour for each point) seem low, since they correspond to only 37 pounds of NO_x per thousand gallons, while AP-42 recommends an emission factor of 105 for external combustion boilers used for generating electricity, and 60 for industrial boilers, when burning residual oil.

The Emission Summary, on the other hand, shows, for point 1 of facility 1922, NO_x emissions of 7,800 tons per year, corresponding to about 2,000 pounds per hour and an implied emission factor of about 87 pounds per thousand gallons, much nearer to the AP-42 figure. ES does not list point 2 of this facility.

For facility CE01, point 31-32 in Queens County, similar calculations lead to an implied emission factor of 54 pounds of NO_x per 1,000 gallons corresponding to the FDL emissions estimate of 880 pounds per hour, and 80 corresponding to the ES estimate of 1,295 pounds per hour. (This facility also burns residual oil.) The numbers used in the FDL appear to be based on a fuel value of $3,150 \times 10^6$ Btu per gallon of fuel which is almost certainly too high. The ES figures correspond to a more reasonable fuel value of $2,360 \times 10^6$ Btu per gallon.

3.4.1 CONCLUSIONS AND RECOMMENDATIONS

1. There are many apparent discrepancies between emissions estimates for VOC and NO_x as given by the Facility Datalist (FDL) and the

Emission Summary (ES), both products of the AIR-100 system. Thirty-nine such discrepancies are listed in Table 3-5. We recommend that NYSDEC review the original files for the cases listed and either demonstrate that these apparent discrepancies are not real or make the necessary corrections in AIR-100 to abolish the discrepancies.

2. PES has detected apparent internal inconsistencies in the engineering data for several gasoline terminals and utility power plants, as described above. We recommend that NYSDEC review the engineering data and calculations contained in the original files for these facilities and compare these with the values shown in the FDL, to locate causes for the apparent discrepancies. If that review reveals any errors which might have entered systematically into emissions estimates for other facilities in a particular category, the agency should undertake to review the data for all such facilities and make any necessary corrections.

3. PES review of VOC concentrations in stack gases, although very limited in scope (by lack of information), did not reveal any clearly implausible results.

3.5 REVIEW OF POINT-SOURCE ESTIMATION METHODOLOGY

AIR-100 documentation from NYSDEC defines and describes methods used to determine both permissible emission rates and expected rates of emissions from actual operations of permitted sources. It indicates the existence of an essentially sufficient system for implementing emission control based on requirements for industrial facilities to obtain permits for construction and operation. Construction permits expire, unless reviewed, after 1 year, and permits to operate must be renewed after 3 years. Permissible operations are defined in detail, in terms that are in some cases equivalent to emission factors (i.e., proportional to throughput) and in others, not. Types of sources covered are listed in Table 3-6.

Table 3-6. TYPES OF POINT SOURCES COVERED IN NEW YORK AIR-100 SYSTEM

Processes using photochemically reactive organic solvents
Process, exhaust and ventilation systems
Ferrous jobbing foundries
Byproduct coke oven batteries
Iron and steel processes
Incinerators
Portland cement plants
Petroleum refineries
Sulfuric and nitric acid plants
Stationary combustion installations
Surface coating processes
Petroleum liquids storage and transfer
Dry cleaning (perchloroethylene)
Pharmaceutical manufacturing
Graphic arts

PES concludes that NYSDEC point-source methodology is reasonable and adequate for most of the types of sources covered. However, in some categories the regulations are essentially performance standards which are not necessarily based on enforceable permit stipulations regarding operating time and feed rate. In estimating emissions from such processes, a large factor of engineering judgment is involved. In these categories, of which petroleum refineries constitute an important example, estimates of emissions depend primarily upon the engineering expertise of the agency's staff.

PES expresses no judgment on NYSDEC's staff expertise in this regard, but has no reason to believe that it is short of standard professional competence in the air quality control field.

3.6 REVIEW OF AREA-SOURCE METHODOLOGIES

PES reviewed the NYSDEC documentation describing area-source methodologies, to determine whether all the standard area-source categories (shown in Table 1-2) were included. The New York categories agreed with those in Table 1-2, with minor exceptions, as follows.

Emissions from Gasoline Service Stations are not divided by NYSDEC into the subcategories shown in Table 1-2. The documentation indicates that these emissions were estimated on the basis of a survey of throughput of service stations throughput the nine-county metropolitan area. Presumably equivalent calculations were done yielding, in effect, an emission factor for service stations based on gasoline throughput. If the emission factor is correct, there should be no need to provide the subtotals called for by the format of Table 1-2.

No figures were generated for the category, "Solvent Users - Surface coatings - Other small industrial." This omission is acceptable if NYSDEC believes that it has accounted for essentially all such emissions in its point source inventories. This is clearly not true for the five boroughs of New York City; but, since NYSDEC is treating most industrial sources in the boroughs as area sources (using employment-based emission factors), it would be redundant to furnish a separate estimate for this category.

Information on all subcategories under "Solid Waste Disposal" has been aggregated by NYSDEC into a single category, "Solid Waste Disposal, Forest, Agricultural and Other Open Burning." Tape data bases from a previous inventory are cited as the source of this information. Slash burning is not specifically mentioned.

3.7 REVIEW OF AREA-SOURCE FACTORS AND COMPUTATIONS

3.7.1 GASOLINE SERVICE STATIONS

The methodology described by NYSDEC is consistent with EPA recommendations. Because NYSDEC did not provide basic throughput data, PES cannot confirm the emission estimates given in the county summary tables. However, a check of the total emissions listed for the five boroughs (viz., about 33,000 kg per typical summer weekday) shows that it is within the range expected for the throughput (1,130 million gallons) attributed to the city. The documentation erroneously cites this throughput as 1,130 thousand gallons, but the estimates are evidently based on the appropriate figure.

3.7.2 DEGREASING (SMALL INDUSTRIAL/COMMERCIAL)

The methodology described by NYSDEC is plausible, but there are two problems which are not addressed in the documentation. First, emission factor found from the survey (0.05 lb/capita/year) is much smaller than the factor (3 lb/capita/year) recommended in EPA-450/2-77-028, which is based on a nationwide average; this suggests a possible need for re-evaluation to account for the discrepancy. Second, if the factor is based, as stated, on total emissions from degreasing, then an effort should be made to assure that the point source inventory includes no emissions from degreasing operations. This situation should be clarified.

PES confirms the accuracy of the estimates based on NYSDEC's methodology and assumptions.

3.7.3 DRY CLEANING

The methodology adopted by NYSDEC for the five boroughs is plausible, and PES confirms the estimates given in the summary table for those counties.

The methodology adopted for NYSDEC for the four outer counties is in accord with EPA recommendations. However, PES calculations based on the methodology and factors cited do not agree with the estimates given in the summary tables for those counties. The following table presents the discrepancies (units are kg RVOC per typical summer weekday):

County	NYSDEC Estimate	PES Estimate
Nassau	1,112	3,200
Suffolk	1,135	3,070
Rockland	236	610
Westchester	1,021	1,920

3.7.4 ARCHITECTURAL SURFACE COATING

The methodology adopted by NYSDEC for the five boroughs is in accord with EPA recommendations. However, PES calculations based on the methodology and factors cited do not agree with the estimates given in the summary tables for those counties. PES estimates for these counties are almost exactly twice as large as those shown by NYSDEC in the summary tables.

The methodology adopted by NYSDEC for the four outer counties is equivalent to that used for the boroughs, but is based on a per capita emission factor only half as large as the EPA-recommended factor. For reasons cited in the documentation, it is plausible that a reduced factor should be assumed; the choice of a 50 percent reduction however, seems somewhat arbitrary. PES confirms the estimates of VOC emissions given in the summary tables for these counties, based on the emission factor chosen by NYSDEC.

3.7.5 AUTO BODY REFINISHING

The methodology adopted by NYSDEC for the five boroughs is a plausible modification of the method recommended by EPA, and PES

confirms the estimates given by NYSDEC in the summary tables for these counties.

The methodology adopted by NYSDEC for the four outer counties is in accord with EPA recommendations for this category. PES confirms the estimates given by NYSDEC in the summary tables for these counties, except for Nassau County. While NYSDEC estimates emissions from this category in Nassau County at 1,261 kg per typical summer weekday, PES estimates that the appropriate figure is 3,480.

3.7.6 GRAPHIC ARTS

The methodology adopted by NYSDEC for all counties is in accord with EPA recommendations for this category. PES confirms the estimates given by NYSDEC in the summary tables for all counties except New York and Queens Counties. In these counties it appears that, contrary to EPA recommendations, point source emissions in graphic arts have been subtracted from the area source estimate to produce a revised, lower area source estimate. PES believes that the appropriate estimate for New York County is 1,700 kg per typical summer weekday (instead of 345 shown by NYSDEC) and for Queens County is 2,300 (instead of 559).

3.7.7 COMMERCIAL/CONSUMER SOLVENT USE

The methodology adopted by NYSDEC for all counties is in accord with EPA recommendations, and PES confirms the estimates of VOC emissions given by NYSDEC in the county summary tables.

3.7.8 CUTBACK ASPHALT

NYSDEC has offered no estimates of emissions from paving with cutback asphalt on the ground that no cutback asphalt will be used

in the state after 1980. It is not clear, however, that there were no emissions in the inventory base year, 1980.

3.7.9 PESTICIDES

The methodology adopted by NYSDEC for all counties is a plausible modification of that recommended by EPA. However, according to EPA-450/2-77-028, it would be equally plausible to omit these contributions to the urban VOC emissions on the ground that they are included under Commercial/Consumer Solvent Use. PES confirms the estimates of VOC emissions given by NYSDEC in the county summary tables, except for Bronx. In this county, PES believes that the appropriate estimate based on NYSDEC methodology and factors is 640 kg per typical summer weekday, instead of the value (212) shown by NYSDEC.

3.7.10 STATIONARY SOURCE FOSSIL FUEL COMBUSTION

NYSDEC bases its estimates of emissions from fuel use in the five borough NYC area on projections from a 1975 inventory used for air quality maintenance planning. Projection methods as explained by NYSDEC seem plausible. Emission factors cited in NYSDEC's documentation are, in some cases, slightly different from those found in AP-42. Specific differences are shown in the following table:

Fuel	Pollutant	NYSDEC	AP-42	Units
No. 6 oil	HC (area sources)	4	3	lb/1,000 gal
	HC (power plants)	3	2	lb/1,000 gal
No. 2, 4 oil	HC	5	3	lb/1,000 gal
No. 2	NO_x	12	22	lb/1,000 gal
Gas	NO_x	7,000	700	lb/10^6 cu. ft.

NYSDEC estimates of emissions from fuel use in the four outer counties were based on information from a previous study by the Tri-State Regional Planning Commission, using the same emission factors as in the New York City Area.

Data in NYSDEC's documentation were insufficient to permit PES to verify the estimated emissions shown in the county summary tables.

3.7.11 AIRCRAFT

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.12 RAILROAD LOCOMOTIVES

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.13 VESSELS

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.14 OFF-HIGHWAY VEHICLES

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.15 ONSITE INCINERATION

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.16 OPEN BURNING

Methodology used by NYSDEC for this category is documented elsewhere (EPA-902/4-77-006).

3.7.17 STRUCTURAL FIRES

Methodology used by NYSDEC for this category is based on information from NYS Division of Fire Prevention and on emission factors developed by NADB and published in AP-42.

3.7.18 FOREST FIRES

NYSDEC does not mention any effort to estimate emissions in this category. If such estimates were made, they were presumably included, together with those from Onsite Incineration, Open Burning, and Structural Fires, in NYSDEC's category titled "Solid Waste Disposal/Forest, Agricultural and Other Open Burning." Lack of sufficient information prevented PES from verifying the emissions estimates given by NYSDEC for this category in the county summary tables.